

No. 23-1107

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IN THE  
**United States Court of Appeals**  
FOR THE FEDERAL CIRCUIT

BROADBAND ITV, INC.,

*Plaintiff-Appellant,*

V.

AMAZON.COM, INC., AMAZON.COM SERVICES LLC,  
AMAZON WEB SERVICES, INC.,

*Defendants-Appellees.*

On Appeal from the United States District Court  
for the Western District of Texas  
No. 6:20-cv-00921, Hon. Alan D. Albright

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**OPENING BRIEF FOR APPELLANT  
BROADBAND ITV, INC.**

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**REPRESENTATIVE PATENT CLAIMS AT ISSUE ON APPEAL**

**U.S. Patent No. 10,028,026, Claim 1:**

[pre] An Internet-connected digital device for receiving, via the Internet, video content to be viewed by a subscriber of a video-on-demand system using a hierarchically arranged electronic program guide,

[a] the Internet-connected digital device being configured to obtain and present to the subscriber an electronic program guide as a templated video-on-demand display, which uses at least one of a plurality of different display templates to which the Internet-connected digital device has access, to enable a subscriber using the Internet-connected digital device to navigate in a drill-down manner through titles by category information in order to locate a particular one of the titles whose associated video content is desired for viewing on the Internet-connected digital device using the same category information as was designated by a video content provider in metadata associated with the video content;

[b] wherein the templated video-on-demand display has been generated in a plurality of layers, comprising:

(a) a first layer comprising a background screen to provide at least one of a basic color, logo, or graphical theme to display;

(b) a second layer comprising a particular display template from the plurality of different display templates layered on the background screen, wherein the particular display template comprises one or more reserved areas that are reserved for displaying content provided by a different layer of the plurality of layers; and

(c) a third layer comprising reserved area content generated using the received video content, the associated metadata, and the associated plurality of images to be displayed in the one or more reserved areas in the particular display template as at least one of text, an image, a navigation link, and a button,

[c] wherein the navigating through titles in a drill-down manner comprises navigating from a first level of the hierarchical structure of the video-on-demand content menu to a second level of the hierarchical structure to locate the particular one of the titles, and

[d] wherein a first template of the plurality of different display templates is used as the particular display template for the templated display for displaying the first level of the hierarchical structure and wherein a second template of the plurality of different display templates is used as the particular display template for the templated display for displaying the second level of the hierarchical structure,

[e] wherein the received video content was uploaded to a Web-based content management system by a content provider device associated with the video content provider via the Internet in a digital video format, along with associated metadata including title information and category information, and along with an associated plurality of images designated by the video content provider, the associated metadata specifying a respective hierarchical location of a respective title of the video content within the electronic program guide to be displayed on the Internet-connected digital device using the respective hierarchically-arranged category information associated with the respective title,

[f] wherein at least one of the uploaded associated plurality of images designated by the video content provider is displayed with the associated respective title in the templated video-on-demand display.

**U.S. Patent No. 9,973,825, Claim 1:**

[pre] A method for dynamic adjustment of an individualized electronic program guide where the adjustment is based at least in part on individual viewer consumption of video-on-demand programs on a subscriber TV system to enable navigating by an individual viewer in a TV subscriber household that may have a plurality of viewers to video-on-demand programs offered on a video-on-demand platform of a digital TV services provider which is at least part of a digital TV services provider system, the method comprising:

[a] maintaining, at the digital TV services provider system, an electronic program guide database comprising electronic

program guide data, and a usage history database comprising a log of selection data corresponding to the viewer's consumption of the video-on-demand programs using the video-on-demand platform;

[b] establishing, at the digital TV services provider system, viewer-individualized electronic program guide data for each of a plurality of individual viewers to enable the generation of viewer-individualized electronic program guides for each of said plurality of individual viewers at the subscriber TV system for use in accessing the video-on-demand programs, and allowing each respective individual viewer to access a display of their respective viewer-individualized electronic program guide through a Log-In step by which the respective individual viewer operating the subscriber TV system can be associated with their respective viewer-individualized electronic program guide;

[c] in one or more previous sessions while said respective individual viewer is logged onto their respective viewer-individualized electronic program guide in order to access the video-on-demand programs on the subscriber TV system, tracking, at the digital TV services provider system, said respective individual viewer's consumption of the video-on-demand programs listed in their respective viewer-individualized electronic program guide and saving the selection data in the usage history database;

[d] determining, at the digital TV services provider system, an order of relevance of a plurality of category names for said respective individual viewer selection of video-on-demand programs from their respective viewer-individualized electronic program guide based at least in part on said respective individual viewer's selection data from said one or more previous sessions as stored in the usage history database and reflecting said respective individual viewer's preferences for selection of video-on-demand programs from their respective viewer-individualized electronic program guide, and based at least in part on the electronic program guide data in the electronic program guide database; and



[e] at the start of each new session when said respective individual viewer logs onto their respective viewer-individualized electronic program guide in order to access video-on-demand programs on the subscriber TV system, reordering a current display listing of the category names for categories of video-on-demand programs on said respective individual viewer's viewer-individualized electronic program guide based at least in part on said determined order of relevance.

FORM 9. Certificate of Interest

Form 9 (p. 1)  
March 2023

**UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

**CERTIFICATE OF INTEREST**

**Case Number** 2023-1107

**Short Case Caption** Broadband iTV, Inc. v. Amazon.com, Inc.

**Filing Party/Entity** Broadband iTV, Inc.

**Instructions:**

1. Complete each section of the form and select none or N/A if appropriate.
2. Please enter only one item per box; attach additional pages as needed, and check the box to indicate such pages are attached.
3. In answering Sections 2 and 3, be specific as to which represented entities the answers apply; lack of specificity may result in non-compliance.
4. Please do not duplicate entries within Section 5.
5. Counsel must file an amended Certificate of Interest within seven days after any information on this form changes. Fed. Cir. R. 47.4(c).

I certify the following information and any attached sheets are accurate and complete to the best of my knowledge.

Date: 03/24/2023

Signature: /s/ Jeffrey A. Lamken

Name: Jeffrey A. Lamken

## FORM 9. Certificate of Interest

Form 9 (p. 2)  
March 2023

<b>1. Represented Entities.</b> Fed. Cir. R. 47.4(a)(1).	<b>2. Real Party in Interest.</b> Fed. Cir. R. 47.4(a)(2).	<b>3. Parent Corporations and Stockholders.</b> Fed. Cir. R. 47.4(a)(3).
Provide the full names of all entities represented by undersigned counsel in this case.	Provide the full names of all real parties in interest for the entities. Do not list the real parties if they are the same as the entities.  <input checked="" type="checkbox"/> None/Not Applicable	Provide the full names of all parent corporations for the entities and all publicly held companies that own 10% or more stock in the entities.  <input checked="" type="checkbox"/> None/Not Applicable
Broadband iTV, Inc.		

☐ Additional pages attached

FORM 9. Certificate of Interest

Form 9 (p. 3)  
March 2023

**4. Legal Representatives.** List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

☐ None/Not Applicable ☒ Additional pages attached


**5. Related Cases.** Other than the originating case(s) for this case, are there related or prior cases that meet the criteria under Fed. Cir. R. 47.5(a)?

☐ Yes (file separate notice; see below) ☒ No ☐ N/A (amicus/movant)

If yes, concurrently file a separate Notice of Related Case Information that complies with Fed. Cir. R. 47.5(b). **Please do not duplicate information.** This separate Notice must only be filed with the first Certificate of Interest or, subsequently, if information changes during the pendency of the appeal. Fed. Cir. R. 47.5(b).

**6. Organizational Victims and Bankruptcy Cases.** Provide any information required under Fed. R. App. P. 26.1(b) (organizational victims in criminal cases) and 26.1(c) (bankruptcy case debtors and trustees). Fed. Cir. R. 47.4(a)(6).

☒ None/Not Applicable ☐ Additional pages attached


**CERTIFICATE OF INTEREST**  
**Addendum to Question 4**

**4. Legal Representatives.** List all law firms, partners, and associates that (a) appeared for the entities in the originating court or agency or (b) are expected to appear in this court for the entities. Do not include those who have already entered an appearance in this court. Fed. Cir. R. 47.4(a)(4).

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**OTHER AUTHORITIES**

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**STATEMENT OF RELATED CASES**

No appeal has previously been taken from the proceedings below. There is no case known to be pending in this Court or any other court or agency that will directly affect or be directly affected by this Court's decision in the pending appeal.

## **INTRODUCTION**

This case involves BBiTV's patented improvements to electronic program guides—specialized software technology that TV viewers use to navigate video-on-demand content libraries and to find desired programming. The patents at issue, the '026 patent family and the '825 patent, overcome the limitations of prior-art electronic program guides. Those prior-art guides made it difficult to navigate large content libraries. And they required TV service providers, such as cable companies, to engage in laborious manual programming to add or update content and present that content in the guide. The '026 patent family addresses an improved program guide that allows rapid drill-down navigation through hierarchically arranged content, using displays that automatically reflect content and visual customizations uploaded by content providers (such as Disney and HBO) to a web-based content management system.

The '825 patent, meanwhile, is directed to an improved program guide that increases the efficiency of navigation—reducing the number of key presses required to navigate to specific content. That improved program guide identifies a particular viewer using a log-in step, tracks the logged-in viewer's content selections during a viewing session, determines the relevance of content categories based on selection and viewer profile information, and dynamically generates individualized listing displays with categories arranged in order of relevance.

The district court erroneously found the claims at issue to be directed to unpatentable abstract ideas. The claims here are directed to concrete improvements to electronic program guides—they improve what the district court conceded is a “specialized type of software computer *technology*.” Appx18 (emphasis added). This Court has consistently held, in cases such as *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335-36 (Fed. Cir. 2016), that specific improvements to software technology are not abstract ideas. And in cases such as *Data Engine Technologies LLC v. Google LLC*, 906 F.3d 999 (Fed. Cir. 2018), this Court has upheld claimed improvements to computer user interfaces indistinguishable from those at issue here. The ’026 patent family claims, moreover, advance existing technological processes for generating content listings for new content—“relieving the [TV] provider” of that “burden.” Appx19. Under *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016), that is a patentable, non-abstract invention.

The district court’s ruling to the contrary departs from the claims themselves. It also departs from the standards set forth by the Supreme Court and this Court. The district court disregarded key, technological claim limitations at Step 1 of *Alice Corp. v. CLS Bank International*, 573 U.S. 208 (2014), because they were supposedly routine and conventional. But *Alice* Step 1 asks whether the invention is “directed to an abstract idea.” *Id.* at 219. Only if the invention is directed to such an idea do courts proceed to Step 2: asking whether the claims add limitations—apart from

“‘routine, conventional activit[ies]’” in the “industry”—to “transform [the] abstract idea into a patent-eligible invention.” *Id.* at 217, 225-26 (quoting *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 73 (2012)). Read as a whole, the claims at issue here are plainly directed to patentable improvements to technology.

### **JURISDICTIONAL STATEMENT**

The district court had jurisdiction under 28 U.S.C. §§ 1331 and 1338(a). The district court granted summary judgment in favor of Defendants-Appellees Amazon.com, Inc., Amazon.com Services LLC, and Amazon Web Services, Inc. (“Amazon”) on September 30, 2022. Appx36. The district court entered final judgment on October 24, 2022. Appx37-38. Broadband iTV, Inc. (“BBiTV”) timely filed a notice of appeal on October 25, 2022. Appx3563-3565. This Court has jurisdiction under 28 U.S.C. § 1295.

### **STATEMENT OF THE ISSUES**

1. Whether claims of the ’026 patent family are directed to eligible subject matter under 35 U.S.C. § 101.
2. Whether claims of the ’825 patent are directed to eligible subject matter under 35 U.S.C. § 101.

### **STATEMENT OF THE CASE**

TV viewers today enjoy access to vast libraries of content—everything from movies, to TV shows, to promotional trailers and behind-the-scenes clips—through video-on-demand (“VOD”) services. Viewers can now browse those vast content

libraries efficiently using electronic program guides that offer a visually compelling, dynamic, and interactive experience. Guides present content listings using on-screen displays with varying backgrounds and images. The displays are arranged in an intuitive hierarchy, enabling viewers to quickly drill down to desired content. That presentation is achieved by automatically generating displays from database information, and empowering *content providers* to customize where their content appears in the hierarchy and how it appears in the guide. Food Network can make the display for “Cupcake Wars” distinguishable at a glance from the display for Bravo’s “Top Chef” or PBS’s “Great British Baking Show.” And program guides help viewers quickly navigate to such content by organizing categories within a hierarchy and customizing the guide based on individual viewing history or the popularity of the content.

It was not always that way. In 2004, the priority date of the patents-in-suit, VOD technology was nascent. Program guides were cumbersome to navigate, forcing viewers to click through long lists to locate titles of interest. Content providers like Disney or HBO had little ability to control how content listings were organized or displayed in the guide. And TV service providers were burdened with the work of manually producing listings—and determining how content should be arranged and displayed—for ever-increasing amounts of content.

Milton Diaz Perez, the inventor of the patents-in-suit, changed that. Working at BBiTV, he developed a new VOD system with a novel program guide, based on content listing displays that automatically reflect content and metadata in a database. This case concerns the validity of the patents covering his innovations—whether they are directed to a mere abstract idea, or whether they provide concrete and patentable methods and systems.

**I. BBiTV’S PATENTED TECHNOLOGY ADDRESSES THE SHORTCOMINGS OF CONVENTIONAL VIDEO-ON-DEMAND SYSTEMS AND PROGRAM GUIDES**

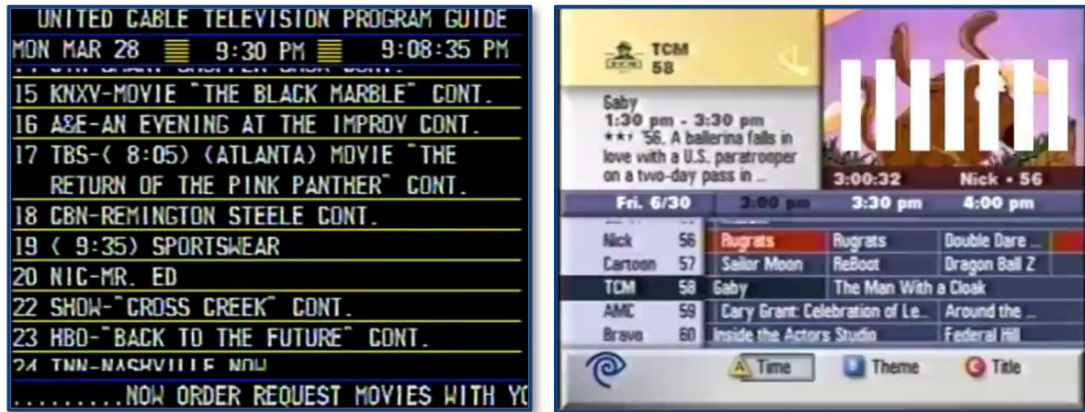
The patents at issue relate to technology for distributing video to viewers through VOD systems. In a typical arrangement, a VOD system includes an “[e]lectronic [p]rogram [g]uide,” and a server with a “[c]ontent [d]atabase.” Appx65(15:25-40). An electronic program guide is specialized software that displays content listings on a viewer’s device—such as a computer, tablet, phone, or set-top box connected to the viewer’s TV. Appx58(2:5-13); Appx18-19. The program guide enables the viewer to navigate available content and select a program for viewing. Appx18-19. The content database, meanwhile, stores the available content, along with “metadata” such as titles and descriptions. The program guide obtains listings of available content, and, once the viewer selects a program, receives and plays back the selected content. Appx18-19.



### A. The Shortcomings of Conventional VOD Program Guides

At the time of the inventions here, around 2004, VOD technologies were nascent. Netflix’s VOD service would not exist for several more years. And cable companies like Comcast had only recently deployed VOD services. Appx58(2:5-13); Appx18-19.

Early VOD systems featured tiny content libraries—“only a few dozen titles,” Appx18—and virtually no interactive features. The technology underlying those early systems reflected their limited ambitions. As shown below, the program guides featured “rudimentary” user interfaces. Appx18. They presented available content in “endless and unformatted lists.” Appx18. Those listings conveyed scant information—little more than program titles and perhaps a few lines of descriptive text that appeared only when the viewer selected a program. Appx19. Those cramped user interfaces made it “cumbersome” to navigate to specific content. Appx2207. They were even worse at helping viewers who did not have a specific program in mind to “*find* something of interest” for viewing. Appx59(3:3-12) (emphasis added).



Appx19.

Early VOD servers and content databases were similarly primitive. They could be accessed only by the TV provider, such as Comcast. Appx2206. Content providers, such as NBC or Disney, had no access. Appx2206. Adding or updating content, moreover, was burdensome. Content providers had to transmit programming to the TV provider—often via expensive, special-purpose satellite networks—for uploading to the content database. Appx2212; *see* Appx19. TV providers were then responsible for manually creating and uploading metadata like descriptive text or still images, as well as for programming the guides to “format and organize listings of content for display.” Appx2211; Appx18.

## **B. BBiTV’s Patented Technology**

BBiTV is a pioneer in enabling TV viewers to access “on demand” video and interactive content through their TVs. In 2003, it partnered with Oceanic Time Warner Cable, Hawaii’s largest TV provider, to launch “PROMO!,” the Nation’s first interactive TV channel for VOD advertising. *About, BBiTV*, <https://www.>

broadband-itv.com/about (last visited Mar. 24, 2023). PROMO! offered viewers access to videos and classified ads for products and services in their local areas. *Id.* In 2005, BBiTV launched “Hawaii TV Classifieds,” a successor to PROMO!, that enabled businesses to publish marketing content and promotional videos to an interactive TV channel for access by viewers. *Id.*

Milton Diaz Perez, the inventor of the patents at issue, joined BBiTV to work on Hawaii TV Classifieds. *See* Appx2276-2277; *About*, BBiTV, <https://www.broadband-itv.com/about> (last visited Mar. 24, 2023). Diaz Perez recognized the potential to offer viewers access to a vast library of content, from a diverse range of content providers besides traditional networks and studios. But he struggled to achieve that vision using Oceanic Time Warner’s conventional VOD system, on which PROMO! was based. He and his team created a “new system” for Hawaii TV Classifieds. Appx2277. Diaz Perez’s system automatically generated content listing displays using information retrieved from a database, and featured a web-based interface for customizing the organization and appearance of listings.

BBiTV obtained patent protection for those inventions. The patents at issue—No. 9,973,825 (the “’825 patent”) and Nos. 9,648,388, 10,536,750, 10,536,751, and 10,028,026 (the “’026 patent family”)—are directed to the novel user interface features of BBiTV’s enhanced electronic program guide, which operate in

conjunction with the functionality of BBiTV's enhanced server and content database.

**C. The '026 Patent Family's Automatically Generated, Customizable Content Listing Displays**

BBiTV's '026 patent family is directed to a method and system that enables a vast array of "programs . . . to be [ ]published on the Internet and readily navigated for display on [a] TV." Appx39(abstract).<sup>1</sup>

The specification observes that, at the time of the invention in 2004, technological advances such as "broadband connections to subscriber homes" had enabled TV providers to offer new functionality to their viewers. Appx58(2:37-65). "Advertisers and content providers" had begun to offer "on-demand advertising, on-demand program content, and on-demand TV transactions." Appx58(2:58-62). In the future, the specification predicted that "VOD content offerings" would "increase dramatically from . . . a few score or hundred 'titles'" to "thousands if not millions of titles." Appx58-59(2:66-3:4). The specification also anticipated that the content available to viewers would expand beyond the "relatively small number of studio-produced program[s]" offered by contemporary VOD systems to include programs from a "large number of new commercial publishers" and even individual "self-publishers." Appx59(3:3-12).

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<sup>1</sup> For convenience, all references in this section to the "claims" or "specification" are to the claims or specification of the '026 patent, unless otherwise specified.

The '026 patent family uses a combination of technologies to enable that “expansion” in programming and capabilities. Appx59(3:3-12). The patents disclose an enhanced “electronic program guide” that automatically generates content listing displays from “templates” and metadata retrieved from a database, and a “web-based content management system” (“WBCMS”) that enables content providers to upload content to the database along with metadata customizing how that content should be organized and displayed in the program guide. Appx59(3:15-54).

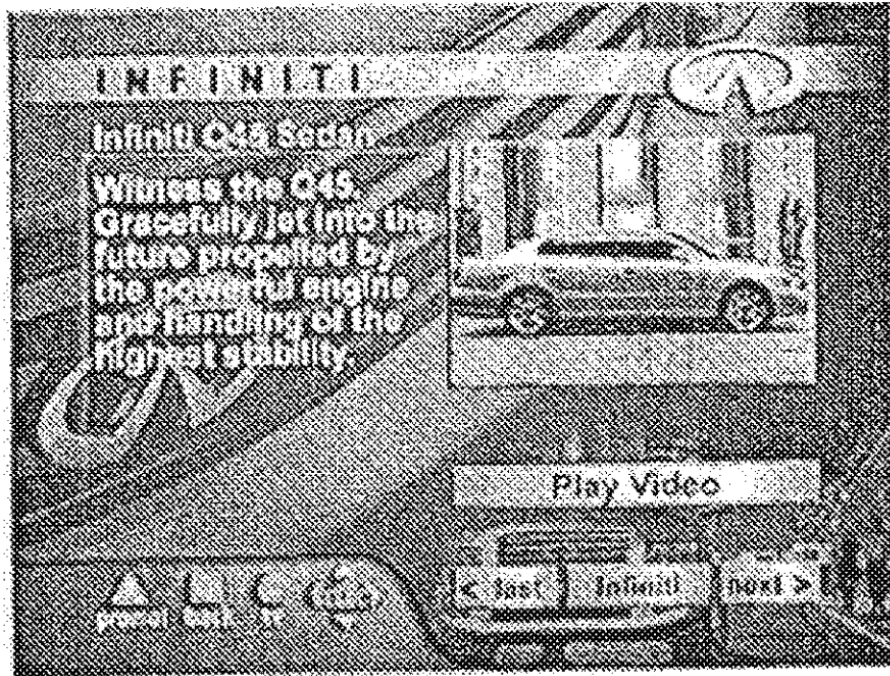
1. *Enhanced Program Guide with Visual Drill-Down Navigation*

One feature of the enhanced program guide is how it allows viewers to “navigate visually through” a library of content to find “specific titles or content.” Appx64(13:35-40). The program guide includes a “User Interface” that presents content listing “displays” that the viewer can navigate using a TV “remote control.” Appx60(6:13-24). The displays present available content in a “hierarchy” of categories that viewers “navigate[.]” “in [a] ‘drill-down’ fashion.” Appx59-60(4:59-5:22). The category “News,” for example, might include the subcategories “ABC,” “NBC,” and “CBS”; those subcategories, in turn, might contain further subcategories, or individual programs. Appx65(15:45-60). In the context of the '026 patent, a “category” can be any grouping of content, including categories “generated using real-time database queries” as the viewer is navigating the guide. Appx61(8:3-6). The “hierarchical categorization” of the program listings is deter-

mined by content providers, not the TV provider. Appx59(3:54-66). Content providers “indicat[e]” where particular titles should appear in the hierarchy through metadata uploaded to the WBCMS. Appx59(3:33-37).

Unlike in the prior art, content listing displays are not limited to showing “unformatted lists” of content. Appx18. Displays can include graphical elements, such as text and images, Appx60(6:18-30), and interactive “links,” “menu[s],” and “buttons,” Appx65(15:45-60). As explained below, the appearance and organization of content listing displays can be customized using “templates,” along with “metadata” uploaded by content providers to the WBCMS. *See* pp. 13-16, *infra*.

The example below—from an embodiment for browsing classified ads—shows how the program guide customizes the appearance of content listings using templates and metadata supplied by the content provider to provide viewers with a “unique visual experience” as they navigate the content library. Appx60(6:60-65). The example below shows a program listing for an “infomercial” for the Infiniti Q45 sedan. The display incorporates Infiniti logos and branding, descriptive text, a preview image from the video, and customized navigation buttons. A different automaker could design a completely different display for content related to its products, by specifying templates and uploading metadata to the WBCMS. *See* pp. 13-16, *infra*.



Appx47(Fig. 1C) (cropped).

The program guide's customizable interface helps viewers to discover content of interest and allows content providers to guide viewers to new or sponsored content. The specification explains that displays can include "navigation aids" to guide users as they browse the content library. Appx60(5:50-57). For example, content providers can insert "[p]romotion[al]" "ads" into displays to grab viewers' attention and guide them to "specific content of high interest." Appx60(6:58-65); *see also* Appx61(7:59-61) (content providers can use "ads . . . to transition viewers from general interest in a product to finding specific information about the product available locally"). The '026 patent family's customizable and flexible system also allows a person with a following, like a celebrity, to curate content for viewers. Hosts can "filter" and "review[]" content, and interactively "link the viewer" to

particular content through “on-screen” navigational menus. Appx59(4:9-20); *see* Appx67(19:1-3) (“[t]he host can then direct viewers to click on an on-screen menu of choices to select” other video “segments”). Finally, the system can collect viewer “track[ing]” and “profil[ing]” information to determine what content is “popular” or “of greater interest to viewers at certain times of day, [or] certain demographics, or in relation to certain products or services.” Appx61(7:10-51). That profiling information, in turn, can then be used to develop content listing displays to direct viewers to popular or more interesting content. Appx61(7:10-51).

## 2. *Automatic and Real-Time Generation of Content Listings Using Templates and Metadata Uploaded by Content Providers*

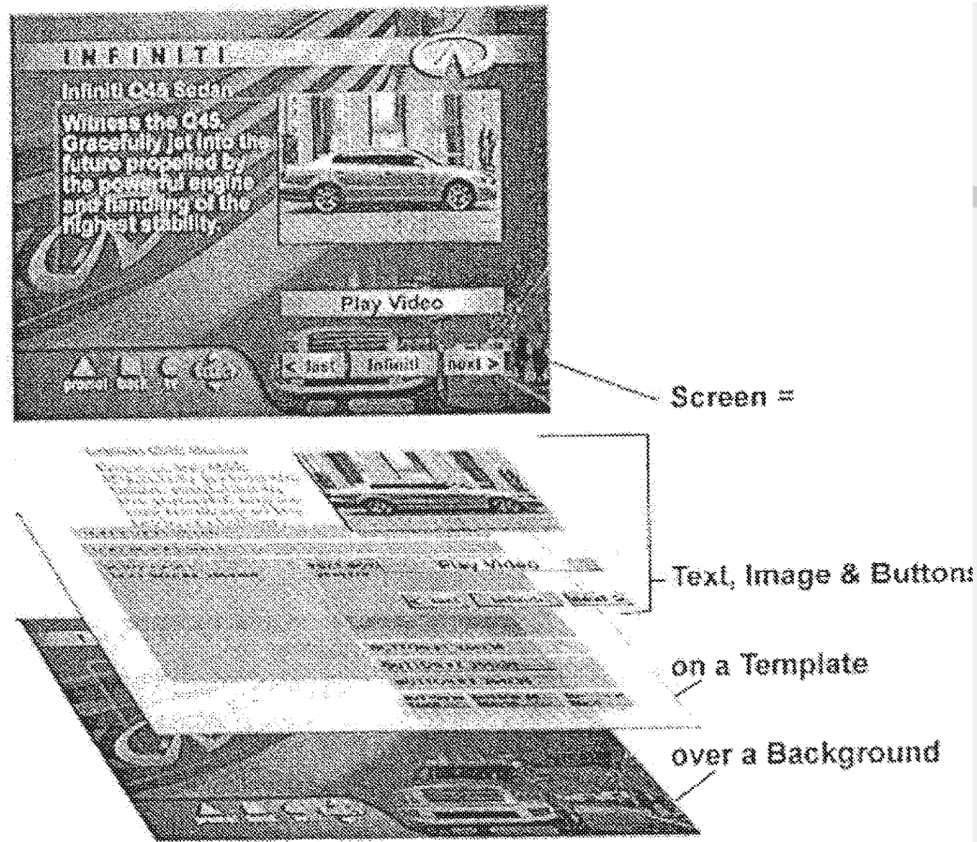
Prior-art technologies required content listing “displays” to be manually “programmed” by the TV provider. Appx61(7:6-10). That made it impractical to generate attractive, customized displays for each item, or to update displays regularly to reflect new content, especially voluminous content that is constantly updated. Appx61(7:6-17). The ’026 patent family overcomes that problem by using displays to list content that are generated *automatically* based on templates, and metadata and images stored in a database, and enabling content providers to customize the organization and appearance of listings. Appx60(5:47-56); Appx61(8:28-45).

A template specifies the visual and navigational elements that should appear on one or more content listing displays. Appx61(7:18-30). A template can provide for certain elements, such as a background “theme” and “logo[s],” or navigational



buttons, to be consistent across several displays. Appx61 (7:18-30). Templates can also “define[] areas [that] are reserved for text, display image(s), and navigation links.” Appx61 (7:23-25). When a specific display is generated—for example, when the viewer navigates to a particular title—the reserved areas in the template are overlaid with text, images, and links “retrieved from the database.” Appx61 (7:25-27).

A template can also provide for content listing displays to be generated in “layers.” Appx61 (7:18-19). In the example below, the template specifies a “[b]ackground screen” with a graphical theme and logos (in this case, branding for the automaker “Infiniti”). Appx61 (7:18-21). A second layer includes navigation buttons that are consistent across displays. Appx61 (7:21-23). The third layer specifies images and text specific to a particular title (here, an infomercial for the Infiniti Q45 automobile). Appx61 (7:25-27). The system then “combine[s]” these layers to generate a display for a specific title. Appx61 (7:28-30).



Appx47(Fig. 1C) (cropped).

Also unlike the prior art, each content listing display is generated from a template “dynamically” as a viewer is using the system, based on information retrieved from the database “using real-time database queries.” Appx60-61 (6:65-7:10, 8:3-15). That enables “database-driven” content listings—where the program guide “User Interface” *automatically* reflects “updated” content and metadata, without requiring laborious manual programming and reprogramming of content listing displays. Appx60-61 (6:51-7:7). For example, by appropriately configuring templates and uploading information to the database, content providers can have the program guide automatically display their “current ... promot[ed]” content.

Appx60-61 (6:51-7:7). Automatic generation of displays from database information also enables advanced navigation features that would be impracticable if displays had to be programmed in advance, such as creating categories for popular content or content recommended by a celebrity host. *See* pp. 12-13, *supra*.

### 3. *Web-Based Content Management System*

To enable content providers to customize how their programs are organized and displayed in listings, *see* pp. 12-13, *supra*, the invention provides a Web-Based Content Management System, or WBCMS. Content providers use a “web browser” to access the WBCMS and upload content and “metadata” such as descriptions and category information. Appx62 (9:32-50); *see* Appx66 (17:30-40). Content providers can also customize the appearance of listings by uploading text and images that can be incorporated into content listing displays through the reserved areas in the templates. Appx61 (7:18-30); *see* p. 14, *supra*. In some embodiments, the WBCMS enables content providers to specify templates used to generate content listing displays and preview the resulting displays. Appx62 (9:40-46); *see* pp. 11-12, *supra*.

In some embodiments, the WBCMS performs additional functions. It can “index[ ]” content for searching “by title and topical area[ ].” Appx62 (9:30-45); *see* Appx61 (8:34-37) (program “is indexed by title and . . . topical area according to the metadata supplied by the [content provider], in accordance with the indexing system

maintained by the Content Management System”). The WBCMS also can prepare content for distribution to viewers by performing “automated size and resolution processing,” “digital format conversion of digital video,” and other processing. Appx62(9:20-65). Once processed by the WBCMS, the content is available for distribution to viewers through a “VOD [c]ontent [d]elivery [s]ystem,” such as a cable network or the Internet. Appx64(13:15-40); Appx65(15:10-25); Appx65-66(16:58-17:4).

#### 4. *Representative Claim 1 of the '026 Patent*

Claim 1 of the '026 patent, which is representative, is directed to an apparatus for navigating a hierarchically arranged content library using the electronic program guide and WBCMS of the invention:

[pre] An Internet-connected digital device for receiving, via the Internet, video content to be viewed by a subscriber of a video-on-demand system using a hierarchically arranged electronic program guide,

[a] the Internet-connected digital device being configured to obtain and present to the subscriber an electronic program guide as a templated video-on-demand display, which uses at least one of a plurality of different display templates to which the Internet-connected digital device has access, to enable a subscriber using the Internet-connected digital device to navigate in a drill-down manner through titles by category information in order to locate a particular one of the titles whose associated video content is desired for viewing on the Internet-connected digital device using the same category information as was designated by a video content provider in metadata associated with the video content;

[b] wherein the templated video-on-demand display has been generated in a plurality of layers, comprising:

(a) a first layer comprising a background screen to provide at least one of a basic color, logo, or graphical theme to display;

(b) a second layer comprising a particular display template from the plurality of different display templates layered on the background screen, wherein the particular display template comprises one or more reserved areas that are reserved for displaying content provided by a different layer of the plurality of layers; and

(c) a third layer comprising reserved area content generated using the received video content, the associated metadata, and the associated plurality of images to be displayed in the one or more reserved areas in the particular display template as at least one of text, an image, a navigation link, and a button,

[c] wherein the navigating through titles in a drill-down manner comprises navigating from a first level of the hierarchical structure of the video-on-demand content menu to a second level of the hierarchical structure to locate the particular one of the titles, and

[d] wherein a first template of the plurality of different display templates is used as the particular display template for the templatized display for displaying the first level of the hierarchical structure and wherein a second template of the plurality of different display templates is used as the particular display template for the templatized display for displaying the second level of the hierarchical structure,

[e] wherein the received video content was uploaded to a Web-based content management system by a content provider device associated with the video content provider via the Internet in a digital video format, along with associated metadata including title information and category information, and along with an associated plurality of images designated by the video content provider, the associated metadata specifying a respective hierarchical location of a respective title of the video content within the electronic program guide to be displayed on the Internet-connected digital device using the respective hierarchically-arranged category information associated with the respective title,

[f] wherein at least one of the uploaded associated plurality of images designated by the video content provider is displayed with the associated respective title in the templatized video-on-demand display.

Appx68-69(22:11-23:7).

#### **D. The '825 Patent's Viewer-Individualized Program Guides**

The '825 patent, which has a similar specification as the '026 patent, discloses an electronic program guide for navigating hierarchically arranged content libraries that “dynamically adjust[s] its display listings . . . to minimize the number of remote control keypresses needed for a viewer to navigate to a title of interest.” Appx70(abstract).<sup>2</sup>

The specification explains that, in prior-art program guides, large content libraries would be presented using correspondingly lengthy listings. It would take a viewer a long time and many “keypresses on the remote control” to navigate through lengthy lists of categories and titles to a program of interest. Appx101(19:16-21). The patent solves that problem through a system that “track[s]” a “viewer’s past history of [program guide] navigation and TV program selection,” and “dynamically reorder[s]” the “categories, subcategories, and/or titles displayed in the [guide]” based on anticipated “relevance to the viewer.” Appx101(19:21-30).

To track viewing history, the program guide introduces a log-in process to identify the “current viewer.” Appx101(19:41-55). Once the viewer logs in, the program guide keeps track of “all EPG navigation clicks” during the “TV session.”

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<sup>2</sup> For convenience, all references in this section to the “claims” or “specification” are to the claims or specification of the '825 patent, unless otherwise specified.

Appx101(20:16-22). User viewing history is stored in a “usage history database.”

Appx101(20:58-63). The system also maintains a “[u]ser [p]rofile,” which contains demographic information and preferences for the viewer. Appx101(20:51-57).

At the beginning of a viewing session, the program guide performs a “reordering process” for categories in the listings. Appx102(22:27-32). The reordering process applies a “viewer preference algorithm[.]” to determine an “[.]ordering of category names and titles” “likely” to predict the viewer’s future selections. Appx102(22:27-32). The preference algorithm can prioritize categories related to content the viewer has previously selected, to reduce the number of clicks required to navigate to that content. For example, if a viewer frequently selects episodes of a particular drama, the system can prioritize the category “Drama” in the content listings.

The program guide is not limited to simply reordering items within categories. As explained above, the system supports dynamically creating categories based on database queries. *See* pp. 15-16, *supra*. The program guide can leverage that feature to “automatically create a category or subcategory” for especially relevant content based on the viewer’s “usage pattern[s].” Appx102(22:32-65).

Reflecting that innovative system, Claim 1 (which is representative) recites:

[pre] A method for dynamic adjustment of an individualized electronic program guide where the adjustment is based at least in part on individual viewer consumption of video-on-demand programs on a subscriber TV system to enable navigating by an individual viewer in a TV subscriber

household that may have a plurality of viewers to video-on-demand programs offered on a video-on-demand platform of a digital TV services provider which is at least part of a digital TV services provider system, the method comprising:

[a] maintaining, at the digital TV services provider system, an electronic program guide database comprising electronic program guide data, and a usage history database comprising a log of selection data corresponding to the viewer's consumption of the video-on-demand programs using the video-on-demand platform;

[b] establishing, at the digital TV services provider system, viewer-individualized electronic program guide data for each of a plurality of individual viewers to enable the generation of viewer-individualized electronic program guides for each of said plurality of individual viewers at the subscriber TV system for use in accessing the video-on-demand programs, and allowing each respective individual viewer to access a display of their respective viewer-individualized electronic program guide through a Log-In step by which the respective individual viewer operating the subscriber TV system can be associated with their respective viewer-individualized electronic program guide;

[c] in one or more previous sessions while said respective individual viewer is logged onto their respective viewer-individualized electronic program guide in order to access the video-on-demand programs on the subscriber TV system, tracking, at the digital TV services provider system, said respective individual viewer's consumption of the video-on-demand programs listed in their respective viewer-individualized electronic program guide and saving the selection data in the usage history database;

[d] determining, at the digital TV services provider system, an order of relevance of a plurality of category names for said respective individual viewer selection of video-on-demand programs from their respective viewer-individualized electronic program guide based at least in part on said respective individual viewer's selection data from said one or more previous sessions as stored in the usage history database and reflecting said respective individual viewer's preferences for selection of video-on-demand programs from their respective viewer-individualized electronic program guide, and based at least in part on the electronic program guide data in the electronic program guide database; and



[e] at the start of each new session when said respective individual viewer logs onto their respective viewer-individualized electronic program guide in order to access video-on-demand programs on the subscriber TV system, reordering a current display listing of the category names for categories of video-on-demand programs on said respective individual viewer's viewer-individualized electronic program guide based at least in part on said determined order of relevance.

Appx103(23:28-24:24).

Dependent Claim 14, asserted here, recites a refinement of the above method wherein viewer history information is “used to create automatically a new category.”

Appx104(25:20-25).

## **II. PROCEEDINGS BELOW**

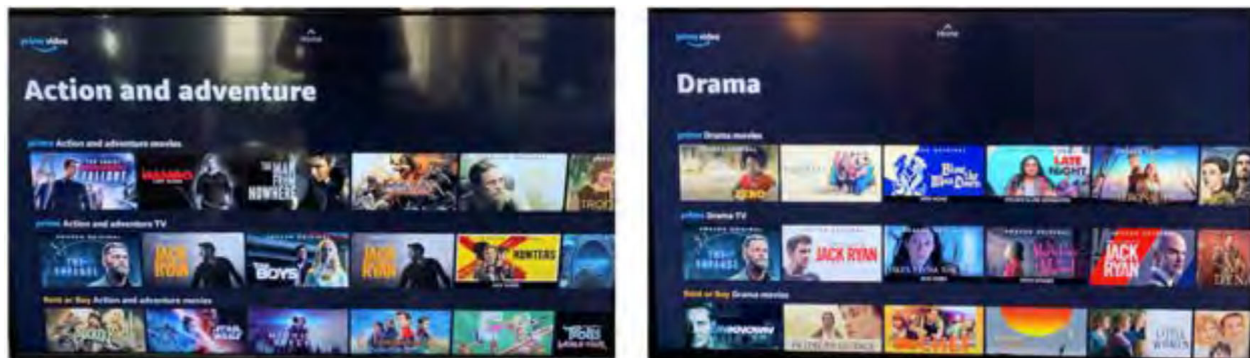
Amazon sells a range of “Fire TV” streaming video players that allow viewers to browse and play back content on Amazon’s “Prime Video” streaming service. Appx1467-1468(¶20). Amazon also offers “apps” for mobile phones, tablets, computers, and “Smart TVs” that provide similar access to its Prime Video service. Appx1467-1468(¶20). Amazon has used BBiTV’s patented technology in those products. On October 6, 2020, BBiTV sued Amazon in the U.S. District Court for the Western District of Texas for Amazon’s infringement of the ’026 patent family and the ’825 patent. Appx179; Appx200. BBiTV filed an amended complaint on August 18, 2021. Appx185; Appx1463.

### **A. The Amended Complaint**

The amended complaint alleges that Amazon’s Fire TV devices and video streaming applications, when used in conjunction with its Prime TV service, infringe

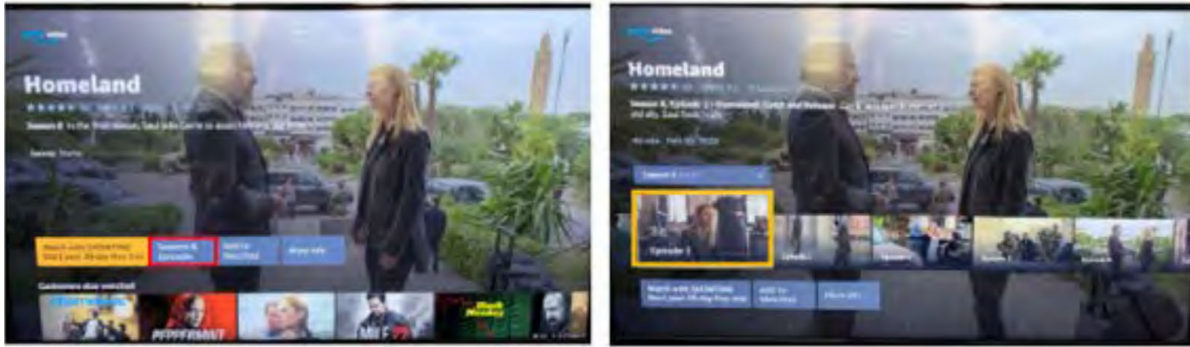
certain claims of the '026 patent family and the '825 patent. Appx1467-1468(¶20), Appx1487(¶48), Appx1507(¶75), Appx1536(¶116), Appx1566(¶157).

The '026 Patent Family. The accused products include an electronic program guide for navigating a hierarchically arranged content library. Content is organized into categories, such as “[a]ction and adventure” and “[d]rama.”



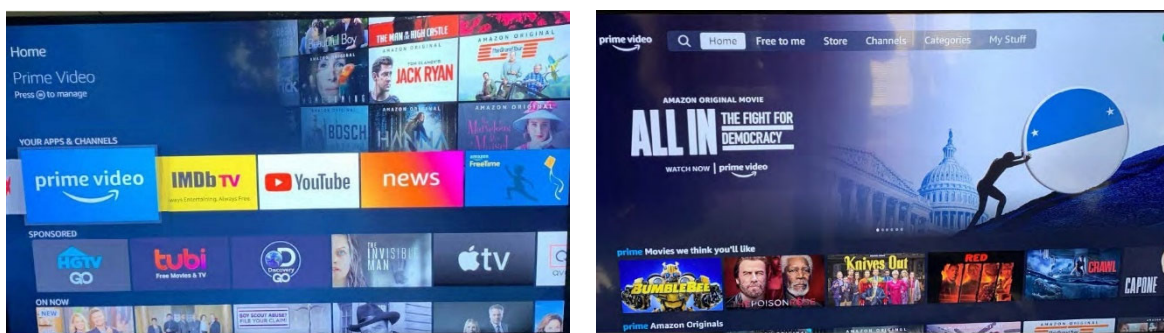
Appx1560-1561(¶143).

The guide presents content listing displays including text, images, and navigation buttons. Displays incorporate backgrounds and branding supplied by content providers. The example also shows how displays are generated using templates and layers. Comparing left and right images below, the background layer remains consistent while other elements in a foreground layer change in response to the viewer's selection of navigation elements.



Appx1472(¶26).

Those guides are generated by practicing claims 1, 6, and 7 of the '026 patent; claims 1, 3, and 8 of the '751 patent; claims 1, 7, and 8 of the '750 patent; and claims 1, 13, and 17 of the '388 patent. *See* Appx2608. Amazon's accused products dynamically generate displays using content from a database to guide users to content of interest. Appx1567-1568(¶160). In the example shown below on the left, a display promotes "sponsored" content. In the example on the right, the display points the viewer to other content of interest.

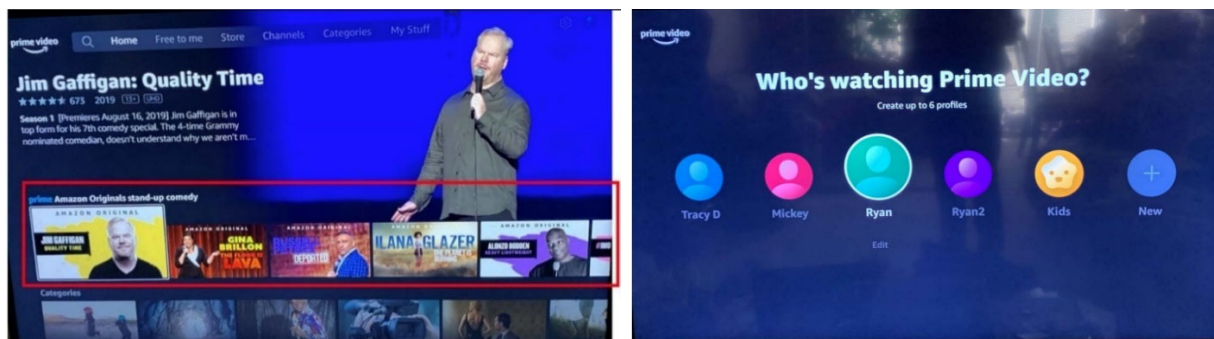


Appx1567-1568(¶160) (annotations removed).

The amended complaint explains how Amazon provides a WBCMS with a web-based interface that enables content providers to publish programs, and upload

“[c]ategory” metadata and “[k]ey [a]rt” that determines how that content is organized and presented in the program guide. Appx1475.

The '825 Patent. Amazon also infringes claims 1, 10, 15, and 17 of the '825 patent. *See* Appx2608. The accused products' program guide adjusts the order of categories and programs based on a user's viewing history. For example, a viewer might watch “Jim Gaffigan” and “Jimmy O. Yang” stand-up comedy specials. Appx1573(¶163). By tracking the viewer's past consumption of these programs, the program guide may move the category “Amazon originals stand-up comedy” to the top of the list, as shown below on the left. As shown on the right, a user's viewing habits are tracked in a “profile” that is associated with a viewing session through a “log in” step.



Appx1573-1574(¶¶ 163-164).

## **B. The District Court Grants Amazon's Summary Judgment Motion**

Amazon moved for summary judgment on June 21, 2022, arguing that the patents-in-suit are directed to unpatentable subject matter under 35 U.S.C. § 101. The district court granted Amazon's summary judgment motion. Appx1.

The district court began by finding that an electronic program guide is a “specialized type of software computer technology” akin to an “electronic spreadsheet.” Appx18. The district court also found that the patents-in-suit had succeeded in overcoming the shortcomings of “rudimentary” prior-art program guides by making it easier for “viewers to find any program of interest,” as well as by “reducing the labor” required of TV providers “to arrange the content and descriptive information in an EPG in a usable manner” through “automating” that process. Appx19. Nonetheless, the district court found the patents directed to ineligible abstract ideas. Appx24, Appx32.<sup>3</sup>

#### 1. *The '026 Patent Family*

At Step 1 of *Alice*, the district court ruled that the '026 patent family claims are “directed to the abstract idea of receiving hierarchical information and organizing the display of video content.” Appx29. The court recognized that the invention combined two key features: a program guide displaying listings automatically generated using metadata *from content providers*, and a web-based content management

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<sup>3</sup> The district court rejected the argument that the decision in *Broadband iTV, Inc. v. Oceanic Time Warner Cable, LLC*, 135 F. Supp. 3d 1175, 1178 (D. Haw. 2015), *aff'd*, 669 F. App'x 555 (Fed. Cir. 2016), involving BBiTV '336 patent, has collateral-estoppel effect in this case. The court held that the patents in this case “vary sufficiently in their claim scope compared to the '336 patent” such that collateral estoppel does not apply. Appx20.

system *for content providers* to specify templates and upload metadata. Appx29. The district court analyzed those two aspects of the invention separately.

The district court characterized the claimed display of automatically generated program listings as directed to “organizing video titles by displaying them in a hierarchical manner.” Appx30. It rejected BBiTV’s argument that, under *Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc.*, 880 F.3d 1356 (Fed. Cir. 2018), and *Data Engine Technologies LLC v. Google LLC*, 906 F.3d 999 (Fed. Cir. 2018), the claims are directed to a patentable improvement to computer user interfaces, Appx31. In the court’s view, the claims do not recite “specific structures to improve the user interface[.]” Appx31. The court did not consider the particular use of the claimed templates here—to allow generation and display of program listings based on metadata from the content-provider. Appx32. Instead, it found that “templates [are] an abstract concept” and a “routine and conventional practice” that is “ancillary to the overall goal of displaying titles hierarchically.” Appx32.

The district court characterized the claimed generation of display listings, from templates and metadata, as a “computerized implementation of the *business process* of receiving video content and information from people who want to show videos, such as using an intake form or template, and then using that form/template information to present to viewers a hierarchy of information about available videos.” Appx29 (emphasis added). It acknowledged that the invention made that process

less “laborious,” but attributed that advantage to the “inherent computational power of computers,” not the invention itself. Appx30. It did not address whether the claims as a whole—display in a program guide of listings that are automatically organized and generated from templates and metadata specified by the content provider—are abstract.

The district court then turned to Step 2 of *Alice*, which requires courts to address whether the claim limitations “add enough” to the abstract idea to “qualify as [a] patent-eligible . . . appl[ication]” of that idea. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 75-76 (2012) (emphasis omitted). The district court ruled that the claims merely recited “generic and conventional components, arranged in a conventional manner.” Appx32. It held that there was no “factual dispute as to whether a WBCMS is conventional at *Alice* step two” because “BBiTV’s expert . . . admitted that ‘there would have been sites that allowed for video to be uploaded over the web’ in the 1990s.” Appx32. It also held that “[h]ierarchical navigation” and “templates” are “fundamental human practices” and “cannot provide an inventive concept.” Appx33. Finally, the court held that the ordered combination of those elements in the patent was not “unconventional.” Appx34. The court “agree[d] with BBiTV,” however, that “the claims do not monopolize or preempt a field of technology or a fundamental tool of science.” Appx35.

## 2. *The '825 Patent*

The district court then addressed the validity of the asserted claims of the '825 patent. At *Alice* Step 1, the court determined that the '825 patent claims are “directed to the abstract idea of collecting and using a viewer’s video history to suggest categories of video content.” Appx20. The court characterized the claims as performing the same function as “recommending certain types of videos based on a user’s rental history,” similar to what “clerks at video rental stores” might do. Appx20.

The district court compared the '825 patent claims to claims addressed in cases such as *Free Stream Media Corp. v. Alphonso Inc.*, 996 F.3d 1355 (Fed. Cir. 2021), that were “directed to collecting information about a user’s past behavior and providing content based on that information”; such claims had been held unpatentably abstract. Appx20-24. The district court found that the '825 patent claims “are not directed to a new or improved graphic user interface” because, in its view, they “provide[d]” insufficient “detail[s] about the claimed interface.” Appx23-24.

Turning to Step 2 of *Alice*, the district court determined that the claimed user history database and log-in step are purely conventional. Appx25-26. It also found that the claimed rearranging of the program guide menus at the beginning of the viewing session “could be performed by a human with paper and a pencil” and thus “is not a technological improvement.” Appx26.



## **SUMMARY OF ARGUMENT**

**I.A.** The '026 patent family claims are directed to eligible subject matter under § 101. This Court has made clear that claims directed to a specific improvement to computer functionality are not abstract ideas under Step 1 of *Alice*. That includes specific improvements to computer user interfaces that make it faster and more efficient to navigate and access data. The '026 patent family claims fall squarely within that category of non-abstract inventions. They are directed to an improved electronic program guide that allows drill-down navigation through hierarchically arranged content, using displays that *automatically* reflect new content and visual customizations uploaded by content providers to a web-based content management system. The claims recite a “specific solution” to the shortcomings of prior-art program guides, which made it difficult to navigate large content libraries, and required extensive manual effort by TV service providers to make new and updated content available to viewers in the program guide. The claims are thus directed to a patent-eligible invention under *Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc.*, 880 F.3d 1356 (Fed. Cir. 2018), and *Data Engine Technologies LLC v. Google LLC*, 906 F.3d 999 (Fed. Cir. 2018).

Separately, the '026 patent family claims recite a patentable improvement to the prior-art process performed by TV service providers of receiving new content, determining how to arrange and display it in the program guide, and producing

content listing displays including that content. The '026 patent family claims enable automation of that process using templates with a specific structure to generate content listing displays from content and metadata stored in a WBCMS by content providers. Under *McRO, Inc. v. Bandai Namco Games America Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016), the claims are directed to a patentable improvement to an existing technological process.

The district court ruled that the claims are “directed to the abstract idea of receiving hierarchical information and organizing the display of video content.” Appx29. That characterization disregards the claims, which recite not only hierarchical display of content, but a particular manner of displaying and interacting with hierarchically arranged content using displays that rely on templates to automatically present information uploaded to a WBCMS. And precedent forecloses the district court’s approach of discarding the claimed templates and WBCMS on the assumption that those elements were purely conventional.

**B.** Alternatively, the claims are directed to an inventive combination and are therefore patentable under Step 2 of *Alice*. The claims here go well beyond the idea of hierarchical display of content listings. They recite automatic generation of content listing displays using templates and metadata retrieved from a WBCMS. And they enable content providers to customize content listings by uploading information to a WBCMS. Those additional elements, in addition to making it easier

for viewers to navigate vast content libraries, reduce the burden on TV service providers by automating a formerly laborious process. The district court acknowledged those benefits. And its reasons for finding templates and the WBCMS purely conventional are unsupportable. At the very least, the district court improperly resolved genuine disputes of material fact as to whether templates or the WBCMS were purely conventional in the industry in 2004.

**II.A.** The '825 patent claims are similarly addressed to a patentable improvement to electronic program guide user interfaces. The claims increase the efficiency of navigation by identifying a viewer using a log-in step, tracking the menu selections of a logged-in user during a viewing session, determining the relevance of categories of content based on selection and profile information, and dynamically generating personalized listing displays with categories arranged in order of relevance. Personalized content listing displays that are automatically arranged in order of predicted relevance are a specific improvement to program guide user interfaces under *Data Engine* and *Core Wireless*.

The district court erroneously found that the claims are “directed to the abstract idea of collecting and using a viewer’s video history to suggest categories of video content.” Appx20. The claims do not recite a “recommendation” system, as the district court presumed. Appx25. Instead, they recite a system for reordering categories in a program guide display, based on predicted relevance to a logged-in

viewer, to minimize the number of clicks required to access specific content. The district court's analogy to brick-and-mortar video-store clerks recommending content to customers therefore misses the mark. Video-store clerks cannot rearrange all the shelves in the store in order of predicted relevance to a customer. That is what the '825 patent invention does.

**B.** Alternatively, the '825 patent claims are directed to an inventive combination of features under Step 2 of *Alice*. The claims combine a log-in step for identifying a viewer, a viewing session for tracking viewer selections, and automatic generation of individualized content listing displays based on viewing history. There is no evidence in the record that those elements were ever combined in the art, much less that such a combination was purely conventional activity. At the very least, the district court erred in granting summary judgment.

### **ARGUMENT**

Today, television and video viewers need to navigate vast libraries of content to find programming they desire. The patents-in-suit enhance electronic program guides by allowing viewers to navigate those vast libraries efficiently, find specific titles, and easily identify content that might interest them. And that is not all. The '026 patent family also establishes a method that allows **content providers** to supply the information needed to produce attractive, intuitively arranged content listing displays, eliminating the need for TV providers to engage in the laborious process

of populating their guides. Using the patented advances, content listings are generated automatically using templates, as well as metadata and images that are uploaded by content providers to a database. The '825 patent claims, meanwhile, reduce the number of remote-control keypresses users must employ to navigate to desired programming. They do so by tracking a logged-in viewer's activity and then, at the start of each viewing session, rearranging the categories into which programs are grouped, based on the viewer's viewing history.

These claims are patentable inventions, not abstract ideas. The claims are directed to improvements to electronic program guides—"specialized . . . software computer technology." Appx24. Precedents such as *Core Wireless Licensing S.A.R.L. v. LG Electronics, Inc.*, 880 F.3d 1356 (Fed. Cir. 2018), and *Data Engine Technologies LLC v. Google LLC*, 906 F.3d 999 (Fed. Cir. 2018), make clear that specific improvements to software, including improved computer user interfaces, are not abstract. The '026 patent family claims also provide a technological solution to the "existing technological process" of generating content listing displays, *Alice Corp. v. CLS Bank Int'l*, 573 U.S. 208, 223 (2014); see *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016), as the district court's own findings confirm.

The district court reached a contrary conclusion by reducing the claims to a caricature. For the '026 patent family, the district court stripped the claims of nearly

every element, characterizing each as directed to the idea of “organizing the display of video content” according to “hierarchical information.” Appx29. It fatally truncated the ’825 patent claims too, describing them as directed to “suggest[ing] categories of video content” based on a user’s “video history,” when they are facially directed to something different—improving the efficiency of drill-down navigation by reordering categories of content in the guide based on predicted relevance to the viewer. Appx20. The district court also erred by injecting considerations about “purely conventional” activity from *Alice* Step 2 into its analysis of *Alice* Step 1. The judgment should be reversed.

Standard of Review. This Court reviews a district court’s grant of summary judgment *de novo*. See *Core Wireless*, 880 F.3d at 1361 (applying Fifth Circuit law). Determinations of subject-matter eligibility under § 101 are reviewed *de novo*. *Id.* at 1361. The contention that particular claim limitations are directed to purely conventional activity under Step 2 of *Alice* must be proved by clear-and-convincing evidence. *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018).

## **I. THE ’026 PATENT FAMILY CLAIMS PATENT-ELIGIBLE SUBJECT MATTER**

Section 101 of the Patent Act declares that any “new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof” is eligible for patent protection. 35 U.S.C. § 101. Courts, however, have long made clear that “laws of nature, natural phenomena, and abstract ideas”

are not eligible for patent protection under § 101. *Diamond v. Diehr*, 450 U.S. 175, 185 (1981).

Determining whether a patent covers a patent-ineligible “abstract idea[]” requires a two-step inquiry. *Alice*, 573 U.S. at 217. In Step 1, the court considers whether the claims are “directed to” an “abstract idea[.]” *Id.* If so, the court proceeds to Step 2 and considers whether the claims contain “‘additional features’” that “‘transform’” the abstract idea into a “patent-eligible application” of the idea. *Id.* at 221. A patent-eligible application of an abstract idea is one that contains “an ‘inventive concept’—*i.e.*, an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [abstract idea] itself.’” *Id.* at 217-18 (quoting *Mayo Collaborative Servs. v. Prometheus Labs.*, 566 U.S. 66, 73 (2011)). The ’026 patent family claims at issue here recite patent-eligible subject matter under both steps of *Alice*.

**A. The ’026 Patent Family Claims Are Directed to a Patentable Improvement to Computer User Interfaces (*Alice* Step 1)**

1. *The Claims Recite a Specific Improvement to Program Guide User Interfaces*

It is now familiar ground that “specific improvement[s] to the way computers operate,” including improvements embodied in “software,” are not abstract ideas. *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1336 (Fed. Cir. 2016). Consistent with that, numerous post-*Alice* decisions of this Court have held that claims

“directed to an improved user interface for computing devices” are technological improvements to computer functionality, not abstract ideas. *Core Wireless*, 880 F.3d at 1362; *see Data Engine*, 906 F.3d at 999; *DDR Holdings, LLC v. Hotels.com, L.P.*, 773 F.3d 1245, 1255 (Fed. Cir. 2014). Thus, inventions that enable “faster and easier . . . navigation” of computer features, *Core Wireless*, 880 F.3d at 1365-66, or more “rapid access to . . . information,” *Data Engine*, 906 F.3d at 1008, are patent-eligible inventions under § 101.

Accordingly, this Court has consistently upheld claims directed to improved user interfaces that “provide[] a specific solution” to a pre-existing “problem[] in computers.” *Data Engine*, 906 F.3d at 1008; *see Core Wireless*, 880 F.3d at 1363. In *Alice*’s terms, they use “‘computer technology’” to “improve the functioning of the computer itself.” 573 U.S. at 225. *Data Engine* thus upheld claims for a “notebook-tabbed interface” that enabled more efficient navigation of multi-page spreadsheets. 906 F.3d at 1003. *Core Wireless* upheld claims for an “application summary window” that enabled quicker access to applications on mobile devices with small screens. 880 F.3d at 1362. And *Trading Technologies International, Inc. v. CQG, Inc.*, 675 F. App’x 1001 (Fed. Cir. 2017), upheld claims for a “graphical user interface” for commodities trading that reduced the risk of human error causing



erroneous trades. *Id.* at 1004. District courts have upheld similar claims directed to specific improvements to computer user interfaces.<sup>4</sup>

The claims here fall squarely within the category of patentable user-interface improvements identified in *Data Engine* and *Core Wireless*. At the outset, they recite an improved “electronic program guide”—a type of “User Interface” for finding and viewing video content. Appx68(22:11-14); Appx60(6:23); Appx61(7:67-8:6). The district court found that program guides are specialized software “technology” that enable a viewer to “locate TV programming” on a computer, “similar” to how an “electronic spreadsheet” enables users to “access and manipulate” numerical data on a computer. Appx18.

The ’026 patent family claims are directed to a “specific solution” to the problems with prior-art program guides. *Data Engine*, 906 F.3d at 1008. They teach and claim a “specific interface,” *id.* at 1009—*i.e.*, “a particular manner of . . . presenting information” and “access[ing]” computer features, *Core Wireless*, 880 F.3d at 1362. That interface does not merely feature “drill-down” navigation of “hierarchically-arranged” content listings. Appx68-69(22:21, 23:2). The claims

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<sup>4</sup> See *IDB Ventures, LLC v. Charlotte Russe Holdings, Inc.*, No. 2:17-cv-660-WCB-RSP, 2018 WL 5634231, at \*3-5 (E.D. Tex. Oct. 31, 2018) (Bryson, J.) (“query dialog box”); *Lazer IP, LLC v. Microchip Tech. Inc.*, No. 21-cv-1026-RGA-JLH, 2022 WL 1801272, at \*2-3 (D. Del. June 2, 2022) (“editor system for programming a target microcontroller”); *Local Intelligence, LLC v. HTC Am., Inc.*, No. 5:17-cv-06437-EJD, 2018 WL 1697127, at \*2, 7-8 (N.D. Cal. Apr. 6, 2018) (“refreshing location-relevant communication services on a phone’s display”).

recite further limitations addressing easier-to-navigate and more effective *presentations* of the content listings, based on customized inputs not only by the TV provider (like cable companies) but by others like content providers (such as Disney or NBC), and that automatically reflect updates to the database.

For example, the hierarchical arrangement of listings is based on “category information” supplied by the “content provider in metadata.” Appx68(22:25-27). The displays consist of “layers” with different visual functions, such a layer for “background[s]” and “graphical theme[s]” and a layer for navigation elements. Appx68(22:28-40). Displays incorporate “images designated by the video content provider” to make each listing instantly recognizable. Appx68-69(22:58-23:7). Some claims recite creating a varied appearance in the program guide by using different “template[s]” to display different “level[s] of the hierarchical structure.” Appx68(22:50-57). The result is an engaging, easy-to-use interface that provides a “unique visual experience” for viewers. Appx60(6:60-65). And the system allows content providers—who know and have a strong interest in promoting their own content—to customize how that content is arranged and displayed.

The ’026 patent family claims also recite a “specific implementation” of that interface, *Data Engine*, 906 F.3d at 1012, that uses computer technology to generate rich, customizable displays *automatically*. The claims recite using a “plurality of . . . templates” to describe the appearance of each display in “layers.” Appx68(22:52-

57). Each layer includes specified text, images, and navigational buttons or links. Appx68(22:43-44). Templates also specify “one or more reserved areas” that the program guide later overlays with elements “generated using the received video content, the associated metadata” and “images” designated by the content provider. Appx68(22:39-45). That ability to overlay elements “retrieved from the database” on top of other graphical elements specified in the template itself enables “database-driven management of content within the User Interface,” such that displays *automatically* reflect updates to the database. Appx61(8:3-6). The claimed implementation, using templates and a content database, enables the program guide to display listings in a timely and attention-grabbing manner that can easily be customized by content providers. Appx30. And those innovations eliminate the need for the TV providers to laboriously create and arrange innumerable listings and presentations for the myriad programs they offer (but with which they may have little familiarity). Appx30.

As the district court found, the invention solves identified “problems” in the prior art. Appx19. Prior-art programming guides were “rudimentary” and “not well suited . . . to display[ing] rapidly growing quantities of movies.” Appx18-19. Worse, they required “laborious” manual programming of content listings. Appx25. The ’026 patent family claims “improve[.]” on that prior art. Appx19. They enable

an easy-to-navigate program guide that is customizable by content providers, while “significantly reducing the labor required to” achieve that result. Appx19.

Those claims easily satisfy the requirements of Step 1 under this Court’s *Data Engine* decision. The claims in *Data Engine* were directed to “a highly intuitive, user-friendly interface with familiar notebook tabs for navigating” multi-page spreadsheets. 906 F.3d at 1008. In upholding those claims, this Court observed that the inventor had sought to address problems with prior-art spreadsheet software, which was “burdensome” to navigate when dealing with spreadsheets containing multiple pages. *Id.* It also noted that the claims recited a “specific interface” and specific “method of navigating through spreadsheet pages.” *Id.* at 1008-09. The claims recited “a row of spreadsheet page identifiers along one side of the first spreadsheet page, with each spreadsheet page identifier being a notebook tab” and “at least one user-settable identifying character to label [each] notebook tab.” *Id.* The claims also “describe[d] navigating through the various spreadsheet pages through selection of the notebook tabs.” *Id.* Those recitations amounted to a “technical solution and improvement in computer spreadsheet functionality,” not an abstract idea. *Id.*

The claims here recite a similar “technical solution and improvement” in the creation and functionality of program guide content listing displays. As the district court found, electronic program guides are “specialized” “software . . . *technology*.”

Appx18 (emphasis added). Just as *Data Engine* recites novel tabs to make it easier to navigate spreadsheets, the claims here recite hierarchically arranged content listing displays that viewers can easily navigate in a drill-down manner. *See* pp. 39-41, *supra*. The claims do not merely specify hierarchical arrangement of those listings. They enable content providers, rather than the TV provider, to customize how listings are arranged, and provide images and substance for the listings. And they allow for near-instantaneous updating of portions of the listing by linking it to an updatable database. Those concrete and useful features are not directed to an abstract idea. They are directed to a specific structural and technological solution that is patentable under *Data Engine* and *Alice*.

2. *The Claims Recite a Technological Improvement to an Existing Technological Process*

In *Alice*, the Supreme Court explained that an invention that “solve[s] a technological problem in ‘conventional industry practice’” or “improve[s] an existing technological process” is eligible for patenting. 573 U.S. at 223. Elaborating on that insight in *McRO*, this Court explained that programming a computer to “perform a *distinct* process to automate a task previously performed by humans” can be a patentable invention. 837 F.3d at 1314 (emphasis added); *see Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343, 1348 (Fed. Cir. 2018) (claims directed to a “specific technique that departs from earlier approaches to solve a specific computer problem” are not abstract ideas).

As the district court found, the '026 patent family improved and automated the existing industry process of producing content listings. Appx19. As explained above, prior-art program guides required manual programming of listings. *See* pp. 6-7, *supra*. The process was “laborious” and could not easily accommodate exponential increases in the number of available titles in content libraries. Appx30; *see* Appx18 (finding that it would have been “difficult” using prior-art methods for TV providers to “populate” program listings for vast content libraries).

That process was also technological. Using computers, the TV provider would generate a specific technological tool, an electronic program guide, for users to employ. The '026 patent family's improvement to that process is likewise technological. It substitutes *manual* specification of content listings with *automated* generation of displays based on templates, and metadata and images uploaded by *content providers* to a database. Appx19; *see* pp. 39-40, *supra*. As the specification explains, the invention enables “database-driven management of content,” and enables the “User Interface” to automatically reflect “update[s]” to the database. Appx61 (7:1-3, 8:3-6). Put differently, the '026 patent family replaces one technological system, prior-art program guides, which were difficult to program and required extensive TV-provider involvement, with a *different* and improved technological system, that uses specific technical means, to make it easier to operate and

that in fact can be populated directly by content providers, not just TV providers like cable companies. That is not an abstract idea.

But even if one characterizes the prior-art process as a non-technological “business process,” as the district court did, Appx29, the claims are not abstract. The claimed invention “automate[s]” the prior-art procedure using a “*distinct* process.” *McRO*, 837 F.3d at 1314 (emphasis added). It does not direct users who formerly conducted a process manually to now do the same thing using a computer. Cable company employees programming prior-art electronic program guides did *not* use templates that specified the appearance of the display in layers, or superimpose text and images retrieved from a database onto background graphics and logos. *See pp. 6-7, supra*. Even putting aside the superiority of the resulting content listings produced by the invention, the invention achieves its results using a different, technological process, not by performing the same steps as in the prior art on a computer. *See also CardioNet, LLC v. InfoBionic, Inc*, 955 F.3d 1358, 1370 (Fed. Cir. 2020) (finding claims directed to technological process where there was no “suggestion” that “doctors were ‘previously employing’ the techniques performed on the claimed device”).

This case is thus much like the Court’s decision in *McRO*. That case involved software that used “rules” to automate the process of animating faces in cartoons to match pre-recorded dialogue. *McRO*, 837 F.3d at 1314-15. This Court emphasized

that, because the claims recited “specific rules” that operated in a specific manner, the patent was not directed to ineligible subject matter. *Id.* Here, similarly, the claims operate through specific structures—in this case “templates” with identified characteristics. And while the district court deemed the recited templates “abstract,” the required features are specific and entirely distinct from the prior art. Nearly half the lines of claim 1 of the ’026 patent are directed to the operation of the templates. The claims recite templates that “generate[ ]” displays “in a plurality of layers”; they address the specific layers and their composition; and they explain how the templates specify “reserved areas” that are overlaid with elements “generated using the received video content, the associated metadata, and [an] associated plurality of images” supplied by the content provider. Appx68(22:28-44). Like the “rules” in *McRO*, the recited “templates” here are specific, technological techniques for automating the production of a tangible result from input data. They are not an abstract idea.

3. *The District Court’s Analysis Overlooks the Claim Language and Departs from This Court’s Precedent*

The district court ruled that the claims are “directed to the abstract idea of receiving hierarchical information and organizing the display of video content.” Appx29; *see* Appx31 (“[O]rganizing information in a hierarchy is a longstanding human practice whether it is performed on a piece of paper or on a TV screen.”). But while the preamble to the claims recites that the content is “hierarchically



arranged,” Appx68(22:12-14), that is hardly the claims’ main “focus,” as the district court presumed, Appx29. The operative limitations are directed to the way in which the program guide is generated, how the program guide ***displays*** content listings based on templates and metadata supplied by the content provider, and how it enables the viewer to ***interact with*** hierarchically arranged content. Appx68(22:15-27).

For example, limitations 1[a] and 1[e] recite that the guide arranges displays hierarchically based on “category information” supplied by the “content provider in metadata” uploaded to the WBCMS. Appx68-69(22:20-27, 22:58-64, 23:1-3). Limitation 1[c] recites that the viewer navigates the content library by “drill[ing] down” through that hierarchy of displays. Appx68(22:45-49). Limitation 1[b] recites that the displays are “generated in a plurality of layers” using “template[s]” with specified structure. Appx68(22:28-29). The “focus of these claims” is not hierarchical display of listings. Appx29. The focus is a program guide for navigating that hierarchically arranged content, which automatically generates displays using templates and enables content providers to customize listings by uploading metadata and images to a WBCMS. The district court’s “oversimplifi[cation]” of the claims is “untethered from [their] language,” and improperly strips away the very limitations that provide the “invention’s benefits.” *Enfish*, 822 F.3d at 1337, 1338 (citing *Alice*, 573 U.S. at 217; *Diamond*, 450 U.S. at 188).

*Data Engine* rejected a similarly reductionist characterization of the claims at issue in that case. There, the accused infringer argued the claims were directed to “organizing information using tabs.” 906 F.3d at 1011. But this Court explained that just because the claims incorporated the concept of tabs did not mean they were “‘directed to’ the abstract idea itself.” *Id.*; see *Alice*, 573 U.S. at 217 (invention is not abstract “simply because it involves an abstract concept”). The claims recited “notebook tabs” as “specific structures” that provided a “functional improvement” to spreadsheet user interfaces. *Data Engine*, 906 F.3d at 1011. The same is true here. The claims recite hierarchically arranged content as an element of a specific and tangible user interface for drill-down navigation of a video content library, which provides benefits for TV providers, content providers, and viewers alike.

The district court’s rationale for disregarding key limitations is difficult to reconcile with precedent. The court excised the limitations involving templates and the WBCMS from its Step 1 analysis because it found those elements to be “generic” and “routine and conventional.” Appx31-32. Even setting aside the specific and anything-but-“generic” nature of those features, see pp. 39-40, *supra*, that was error. Courts cannot “dissect the claims into old and new elements and . . . ignore the presence of the old elements in the analysis.” *Diamond*, 450 U.S. at 188. Instead, at Step 1, the question is “whether the claims as a whole are ‘directed to’ an abstract idea, *regardless of whether* . . . aspects of the claim are . . . conventional . . . [or]

routine.” *CardioNet*, 955 F.3d at 1372 (citing *Diamond*, 450 U.S. at 188-89) (emphasis added). Taken “as a whole,” *id.*, the claims here are directed to a program guide that displays hierarchically arranged content **using** template-generated displays, from a specific type of template, and metadata and images supplied by content providers through a specified WBCMS. The district court was wrong to lop off the claimed templates and WBCMS—the very technologies that enable automatic display generation and database-driven content management—based on its view that those elements were conventional or routine.

Insofar as the district court disregarded templates and the WBCMS because they are not “improvements to or new combinations of underlying hardware,” that, too, defies precedent. Appx32. “Software can make non-abstract improvements to computer technology just as hardware improvements can.” *Enfish*, 822 F.3d at 1335. *Data Engine*, *Core Wireless*, *Trading Technologies*, *McRO*, *Enfish*, *DDR*, and myriad other cases have upheld software-based improvements to computers.

Those errors led the district court to misapply *Core Wireless*, *Data Engine*, and *Trading Technologies*. Appx31-32. The court concluded, in a single paragraph, that those precedents are inapplicable because the claims here supposedly do not recite “specific structures.” Appx31. But the district court erroneously overlooked the limitations relating to templates and the WBCMS, which address the “specific interface” and “specific implementation” required by those precedents. *See* pp. 38-

42, *supra*. It did not consider the claims’ recitation of arranging listings according to metadata supplied by content providers, automatically generating displays using templates, setting the specific structure of layers, or overlaying reserved areas in templates with elements retrieved from the WBCMS.

For the same reason, the district court’s reliance on *In re TLI Communications LLC Patent Litigation*, 823 F.3d 607 (Fed. Cir. 2016), is misplaced. *See* Appx30. The claims there recited “stor[ing]” images on a server “taking into consideration [certain] classification information.” *TLI*, 823 F.3d at 610. Those claims bear no resemblance to the claims here, which are directed to specific improvements to program guides for generating, displaying, and navigating content listings that have been arranged hierarchically. *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229 (Fed. Cir. 2016), is also inapposite. *See* Appx23, Appx30. There, the claims recited menus arranged “in a hierarchical tree format,” but did not “claim a particular way of programming or designing the software to create menus that have [the recited] features.” *Ameranth*, 842 F.3d at 1234, 1241. By contrast, the claims here recite with specificity **how** the program guide generates and displays the hierarchically arranged content using specific templates and metadata in an innovative fashion—one that allows automated generation of higher-quality listings while relieving TV-providers of burdensome obligations. *See* pp. 39-40, *supra*.

Neither *TLI* nor *Ameranth*, moreover, involved any claimed improvement to technology or a technological process. *TLI*, 823 F.3d at 614; *Ameranth*, 842 F.3d at 1234. The claims here, by contrast, recite improvements to the “specialized . . . technology” of electronic program guides, Appx18, and improve and automate the pre-existing technological process of producing program guide listings, *see* pp. 42-44, *supra*.

**B. The Claims Recite an Inventive Combination (*Alice* Step 2)**

Because the ’026 patent family claims are not an abstract idea at Step 1, this Court need go no further. *See Enfish*, 822 F.3d at 1339. But even if the claims were read as directed to an abstract idea, the claims recite a patent-eligible implementation under Step 2 of *Alice*.

At Step 2, courts consider the “elements of [the] claim,” “individually and as an ordered combination,” “to determine whether the additional elements transform the nature of the claim” from an abstract idea into a “patent-eligible application” of that idea. *Alice*, 573 U.S. at 217 (internal quotation marks omitted). Claims are directed to a patent-eligible application of an abstract idea where they involve more than performance of “well-understood, routine, and conventional activities previously known in the industry.” *Id.* at 225 (quotation marks omitted).

The claims here add inventive elements that go well beyond the idea of displaying content listings hierarchically in a program guide. They generate displays

automatically from specific template types and data retrieved from a database. And they allow *content providers* to customize the organization and display of program listings by uploading information to a WBCMS. As BBiTV's expert Dr. Michael Shamos explained, it was "unconventional and inventive" in 2004 to offer an "end-to-end solution for content providers to upload VOD content and metadata over the Internet where the metadata is used to determine how the [program guide] organizes the [content listings]." Appx2220. And as explained above, that combination of automation and shifting responsibility for design of content listings to content providers enabled an easy-to-use navigation experience for vast content libraries that was impractical using prior-art program guide technologies. *See* pp. 6-7, 39-40, *supra*. That "specific, discrete implementation" of hierarchical presentation, which produces identified "benefits" over the prior art, is patentable. *Bascom Global Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016) (upholding claims directed to "filtering" content, because they amounted to a "technical improvement over [the] prior art").

The district court's contrary conclusion, and grant of summary judgment in Amazon's favor, is unsupportable. The court concluded that templates are purely conventional based on expert testimony that "'template[s] were a known entity.'" Appx17. But the mere fact that templates were "known" in some general sense does not mean it was "well-understood, routine, and conventional" to use templates in the

manner recited by the claims. *Berkheimer*, 881 F.3d at 1369. As explained above, the claims recite templates with a particular structure that generate displays “in a plurality of layers” and incorporate “reserved areas” that are overlaid by images, text, or other elements when the display is generated. Appx68(22:28-45); *see pp.* 39-40, *supra*. There was no evidence in the record that anyone had *ever* used templates to generate content listing displays as recited here, much less that they had done so in the fashion recited in the claims.

The district court also pointed to the specification to support its conclusion that templates were purely conventional. Appx17. But the portions of the specification it relied on discuss *the invention*, not the prior art. Appx17. For example, the specification defines “template” as an “interactive television screen design” in describing an embodiment of the invention where content providers can select the template used for displaying particular content using the WBCMS. Appx62(9:42-46). The court also pointed to the specification’s description of another embodiment, where “results [from] the Profiling System 16 can be communicated to a Targeting System 17, such as a template design firm.” Appx61(7:44-51); *see* Appx52(Fig. 3). Nothing in that disclosure suggests “‘template design firm[s]’” were providing the claimed templates “off-the-shelf,” as the district court assumed. Appx17.

The district court’s effort to dismiss the WBCMS as purely conventional was likewise erroneous. Appx32-33. The district court relied on the inventor’s supposed

admission that “the WBCMS was available ‘off the market.’” Appx32. But the inventor testified he purchased “[t]he actual server itself”—the physical computer used to operate a WBCMS—“off the market.” Appx3579-3580. He and his team “*design[ed]* the entire web server *application* that ran on that server” themselves. Appx3580 (emphasis added). That shows exactly the opposite; there would have been no reason for them to do so if the recited WBCMS existed off the shelf.

The district court’s only other basis for the conclusion that the WBCMS was conventional was the testimony of BBiTV’s expert that “‘there would have been sites that allowed for video to be uploaded over the web’ in the 1990s.” Appx32. But the fact that one could upload video over the web says nothing about a web-based interface for uploading content together with metadata, and specifying templates to be used in the display of program listings, much less that such an interface was purely conventional in the industry.

Those errors require reversal. *See CosmoKey Sols. GmbH & Co. KG v. Duo Sec. LLC*, 15 F.4th 1091, 1098 (Fed. Cir. 2021) (reversing grant of judgment on the pleadings because district court erred in determining what was “routine or conventional” in the prior art). But even if the issue were debatable, the existence of a genuine dispute of fact precludes summary judgment. *Berkheimer*, 881 F.3d at 1368. Here, at the very least, a reasonable factfinder on the evidence could go either way. Summary judgment was inappropriate.



## II. THE '825 PATENT CLAIMS PATENT-ELIGIBLE SUBJECT MATTER

The '825 patent addresses an additional enhancement to electronic program guides to make it more efficient for viewers to navigate large content libraries. The claims are directed to an electronic program guide that identifies a viewer using a log-in step, tracks the viewer's selections of content during a viewing session, and uses that information to generate individualized content listings where categories are arranged based on relevance to the viewer. The '825 patent claims are directed to eligible subject matter at both steps of *Alice*.

### A. The '825 Patent Claims Are Directed to a Patentable Improvement to Computer User Interfaces (*Alice* Step 1)

1. The '825 patent claims recite improvements to program guide user interfaces that are patentable under *Data Engine* and *Core Wireless*. As explained above, a program guide is a type of user interface for computers. *See* p. 5, *supra*. The '825 patent claims recite a “specific interface”—a particular way of accessing program features and “presenting information in electronic devices.” *Data Engine*, 906 F.3d at 1009 (quoting *Core Wireless*, 880 F.3d at 1362). The program guide presents a log-in to identify a viewer from a plurality of registered viewers, and then establishes that viewer as the “logged on[.]” viewer for the viewing “session[.]” Appx103(23:52-67). After the viewer logs on, the guide generates and presents a “viewer-individualized” “display” of content listings. Appx103(23:52-57).

In the individualized display, categories in the listings are “[ ]order[ed]” based on predicted “relevance” to the logged-on viewer. Appx103(24:20-24). That enables viewers to reach relevant content with a minimal number of keypresses. The individualized display can also include, as recited in claim 5 (which has been asserted), “automatically generat[ed] . . . categor[ies]” that collect and offer rapid access to content likely to be highly relevant. Appx104(26:1-2). As shown below, the log-in (left) and individualized display (right) correspond to graphical, interactive displays in the user interface.

<p><b>MyEPG Login:</b>      ⊗B. <u>Goto MyEPG</u></p> <p>▽ Registered viewers:</p> <p>    ▽ Diaz-Perez, M</p> <p>    ▽ Diaz-Perez, J</p> <p>▽ Enter PIN:</p> <p>    <input type="text"/></p> <p>▽ New Viewer:</p> <p>▽ Enter Name:</p> <p>    <input type="text"/></p> <p>▽ Enter PIN: <input type="text"/></p>	<p><b>MyEPG                      Sports                      Exit MyEPG</b></p> <p>▽ <b>NASCAR</b></p> <p>▽ <b>Tennis</b></p> <p>▽ <b>Horseracing</b></p> <p>▽ <b>Surfing</b></p> <p>▽ <b>Bowling</b></p> <p>▽ <b>Hockey</b></p> <p>▽ <b>... More</b></p> <p style="text-align: right;">(707)</p>
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Appx85(Fig. 5); Appx87(Fig. 7A)

The claims also recite a “specific implementation” of the claimed interface and disclose how the individualized program guides are generated. *Data Engine*, 906 F.3d at 1012. The TV provider’s server maintains a “usage history database” for each registered viewer. Appx103(23:38-44). When an individual logs in using the log-in process, the program guide begins to “track[ ] . . . the individual viewer’s consumption of video-on-demand programs” and “save[s] the selection data in the

usage history database.” Appx103 (23:60-67). At the “start” of a viewing “session,” the guide “reorder[s]” the “display listing[s]” based on the predicted “relevance” of each listing to the viewer. Appx103 (24:16-24). Listings with higher relevance will appear at a higher position in the display, enabling the viewer to access that listing with fewer clicks. The specification discloses various “viewer preference algorithms,” such as predicting relevance based on “time-of-day” or by prioritizing “newly available . . . episodes” of a “frequently view[ed]” show. Appx102 (22:27-35).

That improved program-guide interface solves identified problems with prior-art program guides. Prior art program guides were cumbersome to navigate using TV remote controls. *See* p. 19, *supra*. As the district court found, they “forced” viewers “to scroll through endless and unformatted lists of content.” Appx18. And as content libraries grew, navigating ever-expanding listings would require many “keypresses on the remote” to reach particular items. Appx101 (19:16-21). The claimed viewer-individualized displays enable “faster navigation” by putting the content “with higher relevance to the viewer” up front in the guide. Appx101 (19:25-30).

The claims here are directed to the exact sort of invention that *Core Wireless* held is not an abstract idea. The claims in that case addressed the shortcomings of prior-art mobile device user interfaces, which “required users to ***drill down through***

*many layers* to get desired data or functionality.” *Core Wireless*, 880 F.3d at 1363 (emphasis added). The claims solved that problem using an “‘application summary’” window that displayed a “limited set of data” and enabled a user to quickly “‘launch’” the corresponding application and view the data. *Core Wireless*, 880 F.3d at 1362. This Court held that those claims recited a “specific manner of displaying a limited set of information to the user” and therefore did not attempt to patent an abstract idea. *Id.* at 1363.

The claims here address *the same problem* addressed by the claims upheld in *Core Wireless*, through an improved user interface that is no less “specific” than the claims in that case. The invention here presents a viewer-individualized “display” that presents a limited set of high-relevance content listings (while deprioritizing less relevant listings or moving them to a separate screen). *See* Appx87(Fig. 7A). The display enables a viewer to select a particular item for viewing. And, like the application summary window in *Core Wireless*, the invention here saves users from having to “drill down through many layers [*i.e.*, categories] to get desired data or functionality.” 880 F.3d at 1363. Improved user interfaces, like that of the ’825 patent, that enable users to “‘navigate’” computers “‘quickly and efficiently’” are patentable inventions, not abstract ideas. *Id.* at 1365.

2. The district court’s contrary conclusion that the ’825 patent claims are abstract ideas does not withstand scrutiny. The court characterized the claims as

being “directed to the abstract idea of collecting and using a viewer’s video history to suggest categories of video content.” Appx20. But the claims are not directed to a **recommendation** system. The claimed method produces “viewer-individualized” content listing displays, which are a tangible and interactive part of a user interface. Appx103(23:45-57). The claims also recite using a log-in to establish a viewing session, which is also a tangible part of the user interface. Appx103(23:58-67). The district court’s analogy to “clerks at video rental stores . . . recommending certain types of videos” is therefore inapt. Appx20. A video-store clerk does not rearrange and personalize all the displays in the store according to a customer’s viewing history. That is essentially what the ’825 patent invention does every time a viewer logs on and begins a new viewing session.

The district court ruled that the ’825 patent claims are not directed to an “improved” “user interface” under *Core Wireless* and *Data Engine* because, in its view, the claims recite only the “display of a generic list of categories and provide no other detail about the claimed interface.” Appx23. That reasoning discards claim limitation after claim limitation. It overlooks the claimed “personalized” program guide “displays” with optimized arrangement of categories. It devalues the claimed log-in step (which corresponds to a screen in the user interface) to establish the viewing “session” that enables the viewer’s navigation to be tracked and the content listing displays to be personalized. And it overlooks the “automatically generated”

categories, which appear as distinct items in the user interface. *See* pp. 20-22, *supra*. The court’s observation that the individualized displays appear “generic” in the patent’s figures misses the point. Appx24. The invention is not a display that **looks** different. It is a display that **operates** differently, and more efficiently, by reducing the number of keypresses required to access particular content. Just because that benefit is not apparent in a static image does not mean the invention is abstract.

The district court relied on inapposite cases where claims recited a result without reciting how to accomplish that result. *See* Appx21-22. In *Free Stream Media Corp. v. Alphonso Inc.*, 996 F.3d 1355 (Fed. Cir. 2021), the claims recited “gathering information” about a viewer, “matching [that] information with other content,” and “sending that content” to a “device.” *Id.* at 1361-62. The claims did not recite any specific interface, nor did the claims recite any specifics of the “gathering” and “matching” processes. *Id.* In finding the claims directed to an abstract idea, this Court focused on the claims’ recitation of a “result,” without any recitation in the claims of “how that result is achieved.” *Id.* at 1363-64. In contrast to the claims in *Free Stream Media*, the claims here recite a result—a personalized program guide with an optimized ordering of content listings—and specific steps for **how** to achieve that result through a log-in step to establish a viewing “session”; tracking viewer “selection[s]” in the program guide; and “reordering” entries in the content listing

“display” based on preference algorithms disclosed in the specification and recited in dependent claims. Appx103 (23:54, 24:15-34); *see* pp. 54-56, *supra*.

*Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1369-70 (Fed. Cir. 2015) is similarly inapplicable. There, the claims recited “display[s]” “depicting portions of [a] web site” that are a “function of the user’s personal characteristics.” *Id.* at 1369. The claims recited no specific interface—they did not, for example, recite displaying particular portions in a particular manner. Nor did those claims contain any recitation of *how* to perform such customization. This Court found those “overly broad” claims unpatentably abstract. *Id.* at 1370. The claims here, by contrast, recite both a specific interface and implementation. *See* 54-56, *supra*.

#### **B. The Claims Recite an Inventive Combination (*Alice* Step 2)**

Even if the ’825 patent claims are directed to an abstract idea, the “elements” of the claims, taken “individually ‘and as an ordered combination,’” recite a patent-eligible application of that idea. *Alice*, 573 U.S. at 217 (quoting *Mayo*, 566 U.S. at 79). The claims add three elements to the idea of making recommendations based on viewing history: (1) generating displays where categories are arranged so as to reduce the number of clicks required to access specific content; (2) identifying a viewer using a log-in step and establishing a viewing session; and (3) automatically

creating new categories to encompass highly relevant content (dependent claim 15). *See* pp. 19-22, *supra*; Appx104(26:1-5) (claim 15).

Even taken alone, there was no evidence in the record that it was purely conventional activity to minimize keypresses by generating content listing displays with categories arranged based on relevance. Indeed, Amazon’s expert was unable to identify “any actual VOD provider systems” that arranged content listing displays in that manner. Appx2232. Yet the court found that arranging content listing displays in that manner is “not a technological improvement” because it can be “performed mentally or by pencil and paper.” Appx26. That again turns the *Alice* analysis on its head. At Step 2, claims can be directed to an abstract idea—such as a process that can be performed on pen and paper—while still reciting a patentable “inventive concept” that amounts to more than the abstract idea itself. *Alice*, 573 U.S. at 217-18. For example, *Weisner v. Google LLC*, 51 F.4th 1073, 1087 (Fed. Cir. 2022), upheld claims directed to generating “personalized search results,” a process that could be performed using pen and paper. *Id.* at 1087. Nonetheless, this Court held that generating personalized search results based on “travel histories” is sufficiently “inventive” to find claims patentable at Step 2 of *Alice*. *Id.* at 1088.

The district court made a similar mistake in disregarding Claim 15’s recitation of automatically generated categories based on again analogizing to a video-store clerk’s recommendations. Appx28. The question at Step 2 is not whether a claim



limitation is abstract in some sense, but whether it is routine or conventional. Nothing in the record supports the conclusion that inclusion in the listings of categories generated on the fly from viewing history was purely conventional.

Finally, the “ordered combination” of the log-in process to identify a viewer, tracking viewer selections during a viewing session, and individualized content listing displays, is an inventive concept under Step 2 of *Alice*, *Weisner*, 51 F.4th at 1083, as Dr. Shamos explained, Appx2228. The combination of those elements enables functionality that did not exist in the prior art. Unlike a video store clerk, Appx27, who can see customers walk in the door, a video player cannot see which member of a household is sitting in front of the TV. The log-in step and establishing a viewing session enabled tracking the selections of multiple viewers in the same household. That viewer information, in turn, enabled reordering categories in the program guide for efficient navigation. The district court had no basis to grant summary judgment at Step 2 of *Alice*.

### **CONCLUSION**

The district court’s judgment should be reversed.

March 24, 2023

Respectfully submitted,

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FORM 19. Certificate of Compliance with Type-Volume Limitations

Form 19  
July 2020

**UNITED STATES COURT OF APPEALS  
FOR THE FEDERAL CIRCUIT**

**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME LIMITATIONS**

**Case Number:** 2023-1107

**Short Case Caption:** Broadband iTV, Inc. v. Amazon.com, Inc.

**Instructions:** When computing a word, line, or page count, you may exclude any items listed as exempted under Fed. R. App. P. 5(c), Fed. R. App. P. 21(d), Fed. R. App. P. 27(d)(2), Fed. R. App. P. 32(f), or Fed. Cir. R. 32(b)(2).

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Date: 03/24/2023

Signature: /s/ Jeffrey A. Lamken

Name: Jeffrey A. Lamken

## **ADDENDUM**

**IN THE UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

**BROADBAND iTV, INC.**  
*Plaintiff,*

**v.**

**AMAZON.COM, INC.,  
AMAZON.COM SERVICES LLC  
and AMAZON WEB SERVICES,  
INC.,**  
*Defendants.*

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**Civil No. 6:20-cv-00921-ADA**

**MEMORANDUM OPINION AND ORDER**

Before the Court is the Motion for Summary Judgement of Invalidity under 35 U.S.C. § 101 (the “Motion”) filed by Amzon.com, Inc.; Amazon.com Services LLC; and Amazon Web Services, Inc. (collectively, “Defendants”). ECF No. 111. The Court heard the parties’ arguments during the final pretrial conference held on August 30, 2022, took the motion under advisement, and canceled the jury trial. ECF Nos. 196, 197, 200. After considering supplemental briefing (ECF Nos. 202, 203), Court **GRANTS** Defendants’ Motion for the reasons set forth below.

**I. LEGAL STANDARD**

**A. Motion for Summary Judgment**

“Summary judgment must be granted when, drawing all reasonable inferences in favor of the non-movant, there is no genuine issue as to any material fact.” *Billups-Rothenberg, Inc. v. Associated Reg'l & Univ. Pathologists, Inc.*, 642 F.3d 1031, 1036 (Fed. Cir. 2011); Fed. R. Civ. P. 56(a). “Under 35 U.S.C. § 282, a patent is presumed valid and one challenging its validity bears the burden of proving invalidity by clear and convincing evidence.” *Innovative Scuba Concepts, Inc. v. Feder Indus., Inc.*, 26 F.3d 1112, 1115 (Fed. Cir. 1994). When “‘clear and convincing’ evidence requirement applies, the trial judge’s summary judgment inquiry as to whether a genuine

issue exists will be whether the evidence presented is such that a jury applying that evidentiary standard could reasonably find for either the plaintiff or the defendant.” *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 255, 106 S. Ct. 2505, 2514, 91 L. Ed. 2d 202 (1986); *see also Eli Lilly & Co. v. Barr Lab’ys, Inc.*, 251 F.3d 955, 962 (Fed. Cir. 2001) (“[A] moving party seeking to invalidate a patent at summary judgment must submit such clear and convincing evidence of invalidity so that no reasonable jury could find otherwise.”). In determining whether a genuine issue of material fact exists, the court views the evidence in the light most favorable to the nonmoving party and resolves all doubts in its favor. *Eli Lilly & Co.*, 251 F.3d at 962.

### **B. Patent Eligibility Under 35 U.S.C. § 101**

Section 101 of the Patent Act defines the subject matter eligible for patent protection: “any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof.” 35 U.S.C. § 101. However, courts have long recognized that laws of nature, natural phenomena, and abstract ideas are not patentable under § 101 because they are “the basic tools of scientific and technological work.” *Alice Corp. Pty. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (citations omitted).

In *Alice*, the Supreme Court articulated a two-step framework for distinguishing patents that claim laws of nature, natural phenomena, and abstract ideas from those that claim patent-eligible applications of those concepts. *Id.* at 217. In *Alice* step one, the court must “determine whether the claims at issue are directed to one of those patent-ineligible concepts.” *Id.* In doing so, the court must be careful not to over generalize the invention because “all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.” *Id.* (quoting *Mayo Collaborative Servs. v. Prometheus Lab’ys, Inc.*, 566 U.S. 66, 71 (2012)). Instead, “the claims are considered in their entirety to ascertain whether their character as a whole is

directed to excluded subject matter.” *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1312 (Fed. Cir. 2016) (citation omitted). If the claims are not directed to one of those patent-ineligible concepts, the inquiry ends. If the claims are directed to one of those patent-ineligible concepts, then the inquiry proceeds to step two of the *Alice* framework.

In *Alice* step two, the court considers whether the claims contain an “inventive concept” sufficient to “transform the nature of the claim into a patent-eligible application.” *Alice*, 573 U.S. at 217–18 (quotation omitted). In doing so, the court considers “the elements of each claim both individually and ‘as an ordered combination’” to determine whether they are “‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [ineligible concept] itself.’” *Id.* (quoting *Mayo*, 566 U.S. at 72–73). *Alice* step two is satisfied when the claim limitations “involve more than performance of ‘well-understood, routine, [and] conventional activities previously known to the industry.’” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1367 (Fed. Cir. 2018) (quoting *Alice*, 573 U.S. at 225 and *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat’l Ass’n*, 776 F.3d 1343, 1347–48 (Fed. Cir. 2014)). However, to recite an inventive concept, a patent must do more than recite an abstract idea “while adding the words ‘apply it.’” *Alice*, 573 U.S. at 221 (quoting *Mayo*, 566 U.S. at 72). “[S]imply appending conventional steps, specified at a high level of generality, to laws of nature, natural phenomena, and abstract ideas cannot make those laws, phenomena, and ideas patentable.” *Mayo*, 566 U.S. at 82. Likewise, “the mere recitation of a generic computer cannot transform a patent-ineligible abstract idea into a patent-eligible invention.” *Alice*, 573 U.S. at 223.

“While the ultimate determination of eligibility under § 101 is a question of law, like many legal questions, there can be subsidiary fact questions which must be resolved en route to the ultimate legal determination.” *Aatrix Software, Inc. v. Green Shades Software, Inc.*, 882 F.3d 1121,

1128 (Fed. Cir. 2018). As such, “[t]he question of whether a claim element or combination of elements is well-understood, routine and conventional to a skilled artisan in the relevant field is a question of fact” that must be “proven by clear and convincing evidence.” *Berkheimer*, 881 F.3d at 1368. Additionally, specific improvements described in a patent specification, “to the extent they are captured in the claims, [may] create a factual dispute regarding whether the invention describes well-understood, routine, and conventional activities.” *Id.* at 1369. However, “[w]hen there is no genuine issue of material fact regarding whether the claim element or claimed combination is well-understood, routine, conventional to a skilled artisan in the relevant field, [patent eligibility] can be decided on summary judgment as a matter of law.” *Id.* at 1368.

### C. Collateral Estoppel

The doctrine of collateral estoppel precludes relitigation of an issue if “(1) the identical issue was previously adjudicated; (2) the issue was actually litigated; and (3) the previous determination was necessary to the decision.” *Bradberry v. Jefferson Cnty., Tex.*, 732 F.3d 540, 548 (5th Cir. 2013) (citation omitted). “[T]he issue of whether to apply collateral estoppel is a question of law . . . .” *Soverain Software*, 778 F.3d at 1314 (quoting *Bradberry*, 732 F.3d at 549).

In the patent context, “where a patent has been declared invalid in a proceeding in which the ‘patentee has had a full and fair chance to litigate the validity of his patent’, the patentee is collaterally estopped from relitigating the validity of the patent.” *Miss. Chem. Corp. v. Swift Agric. Chems. Corp.*, 717 F.2d 1374, 1376 (Fed. Cir. 1983) (internal citation omitted).

Collateral estoppel applies to the issue of patent eligibility. *See, e.g., NetSoc, LLC v. Oath Inc.*, No. 18-CV-12267 (RA), 2020 WL 419469, at \*5-9 (S.D.N.Y. Jan. 24, 2020). “[W]here different patents are asserted in a first and second suit, a judgment in the first suit will trigger claim preclusion only if the scope of the asserted patent claims in the two suits is essentially the same.”



*VideoShare, LLC v. Google LLC*, No. 6:19-cv-663-ADA, 2020 WL 6365543, at \*4 (W.D. Tex. May 4, 2020) (quoting *SimpleAir, Inc. v. Google LLC*, 884 F.3d 1160, 1167 (Fed. Cir. 2018)).

“Complete identity of claims is not required to satisfy the identity-of-issues requirement [of collateral estoppel].” *Soverain Software LLC v. Victoria’s Secret Direct Brand Mgmt., LLC*, 778 F.3d 1311, 1319 (Fed. Cir. 2015). Instead, “[i]f the differences between the unadjudicated patent claims and adjudicated patent claims do not materially alter the question of invalidity, collateral estoppel applies.” *Ohio Willow Wood Co. v. Alps S., LLC*, 735 F.3d 1333, 1342 (Fed. Cir. 2013).

## II. UNDISPUTED FACTS

The Court finds that there is no genuine dispute as to the following material facts. These facts come from either the undisputed record or from the nonmovant’s own witnesses and arguments.

### A. Background Facts

Plaintiff Broadband iTV, Inc. (“BBiTV”) alleges infringement of U.S. Patent Nos. 9,973,825 (the “’825 patent”), 9,648,388 (the “’388 patent”), 10,536,750 (the “’750 patent”), 10,536,751 (the “’751 patent”), 10,028,026 (the “’026 patent”). Specifically, BBiTV alleges that Amazon infringes claims 1, 10, 15 and 17 of the ’825 patent, claims 1, 13 and 17 of the ’388 patent, claims 1, 7 and 8 of the ’750 patent, claims 1, 3 and 8 of the ’751 patent, and claims 1, 6 and 7 of the ’026 patent. ECF No. 175 at 6-7.

### B. The ’825 Patent

The ’825 patent is titled “Dynamic Adjustment of Electronic Program Guide Displays Based on Viewer Preferences for Minimizing Navigation in VOD Program Selection,” and lists Milton Diaz Perez as the sole inventor. ECF No. 113-1 (’825 patent) at Cover. The ’825 patent

concerns adjusting the order of categories in a list of video-on-demand (“VOD”) programs based on what a user has watched previously. *Id.*, Abstract, cl. 1. The ’825 patent discloses a “MyEPG” menu that, upon user login, shows an individualized list of VOD categories. *Id.* at 19:41-20:8. This category list may be ordered based on individual users’ “actual viewing habits,” *i.e.*, a log of “the viewer’s consumption of programming content.” *Id.* at 20:58-67.

The inventor Mr. Diaz testified that he did not invent “hierarchical categories and subcategories.” ECF No. 152-2 (Diaz July 30, 2015 Tr.) at 774:15-18. For collecting the users’ viewing data, the ’825 patent discloses “a Tracking System 15 of conventional type” that could collect “viewer navigation data.” ’825 patent at 7:28-38. Such viewing data are exported to a third party “non-biased or unrelated firm” to create user profiles using “profile analysis methods” that the specification does not describe in any detail or specify in any other way. *Id.* at 7:38-41.

According to the ’825 patent, the user’s viewing data is stored in a “Usage History database 703.” *Id.* at 20:58-67. The specification does not disclose any particular structure for the database or otherwise provide any details about it. *See id.*

In the ’825 patent, a “MyEPG Server 702” determines the order of the categories based on the stored viewing data. *Id.* The specification does not disclose any particular structure for the MyEPG server. *See id.*

The ’825 patent states that ordering the categories is based on “relevance schema” or “viewer preference algorithms,” but the specification does not describe any particular “schema” or “algorithm” or provide any details about them. *Id.* at 20:65, 22:28.

Claim 1 of the ’825 patent is reproduced below:

1. A method for dynamic adjustment of an individualized electronic program guide where the adjustment is based at least in part on individual viewer consumption of video-on-demand programs on a subscriber TV system to enable navigating by an individual viewer in a TV subscriber household that may have a plurality of viewers

to video-on-demand programs offered on a video-on-demand platform of a digital TV services provider which is at least part of a digital TV services provider system, the method comprising:

(a) maintaining, at the digital TV services provider system, an electronic program guide database comprising electronic program guide data, and a usage history database comprising a log of selection data corresponding to the viewer's consumption of the video-on-demand programs using the video-on-demand platform;

(b) establishing, at the digital TV services provider system, viewer-individualized electronic program guide data for each of a plurality of individual viewers to enable the generation of viewer-individualized electronic program guides for each of said plurality of individual viewers at the subscriber TV system for use in accessing the video-on-demand programs, and allowing each respective individual viewer to access a display of their respective viewer-individualized electronic program guide through a Log-In step by which the respective individual viewer operating the subscriber TV system can be associated with their respective viewer-individualized electronic program guide;

(c) in one or more previous sessions while said respective individual viewer is logged onto their respective viewer-individualized electronic program guide in order to access the video-on-demand programs on the subscriber TV system, tracking, at the digital TV services provider system, said respective individual viewer's consumption of the video-on-demand programs listed in their respective viewer-individualized electronic program guide and saving the selection data in the usage history database;

(d) determining, at the digital TV services provider system, an order of relevance of a plurality of category names for said respective individual viewer selection of video-on-demand programs from their respective viewer-individualized electronic program guide based at least in part on said respective individual viewer's selection data from said one or more previous sessions as stored in the usage history database and reflecting said respective individual viewer's preferences for selection of video-on-demand programs from their respective viewer-individualized electronic program guide, and based at least in part on the electronic program guide data in the electronic program guide database; and

(e) at the start of each new session when said respective individual viewer logs onto their respective viewer-individualized electronic program guide in order to access video-on-demand programs on the subscriber TV system, reordering a current display listing of the category names for categories of video-on-demand programs on said respective individual viewer's viewer-individualized electronic program guide based at least in part on said determined order of relevance.

*Id.*, cl. 1.

said respective individual viewer's viewer-individualized electronic program guide based at least in part on said determined order of relevance.

**C. A Court Previously Invalidated Related U.S. Patent No. 7,631,336 (the “’336 Patent”)**

**Under § 101**

U.S. Patent No. 7,631,336 (the “’336 patent”) is titled “Method for Converting, Navigating, and Displaying Video Content Uploaded from the Internet to a Digital TV Video-on-Demand Platform.” ECF No. 113-7 (’336 patent) at Cover. The ’336 patent claims priority to U.S. Appl. No. 10/909,192 filed on July 30, 2004 (’192 application). *Id.*

On April 9, 2014, BBiTV filed suit against Oceanic Time Warner Cable, LLC, among others, in the District of Hawaii, alleging infringement of the ’336 patent. *Broadband iTV, Inc. v. Oceanic Time Warner Cable, LLC*, 135 F. Supp. 3d 1175, 1178 (D. Haw. 2015) (ECF No. 113-6).

The Hawaii court held the claims of the ’336 patent ineligible under 35 U.S.C. § 101, concluding that the claims were directed to the abstract idea of “using the same hierarchical ordering based on metadata to facilitate the display and locating of video content” and recited only generic components to implement that idea. *Id.* at 1183, 1186, 1195.

With respect to the claim limitation of “Web-based content management system” in the ’336 patent, the Hawaii court stated: “‘data collection, recognition, and storage’ are ‘undisputedly well-known’ functions for servers. They do not impart any inventive concept.” *Id.* at 1193 (quoting *Content Extraction & Transmission LLC v. Wells Fargo Bank, Nat’l Ass’n*, 776 F.3d 1343, 1347 (Fed. Cir. 2014)). The Federal Circuit affirmed the decision of the Hawaii court under Rule 36 without an opinion. *Broadband iTV, Inc. v. Hawaiian Telecom Inc.*, 669 F. App’x. 555 (Fed. Cir. 2016).

Claim 1 of the ’336 patent is reproduced below:

1. A method for automatically enabling the converting, navigating and displaying of video content from a video content provider on an open online network to a discrete digital TV service provider network which is of the type employing a closed system of pre-screened and pre-programmed video content selectable for viewing by TV service subscribers inputting keypresses on their TV remote control units to set-top boxes connected to their TV equipment, which predetermined video content is listed by title for selection from an electronic program guide for a video-on-demand (VOD) platform of a the discrete digital TV service provider comprising:

(a) enabling the uploading of video content in a digital video format via an online network to a Web-based content management server that is connected to the VOD platform of the discrete digital TV service provider network, along with a title and a hierarchical address of hierarchically-arranged categories and subcategories as metadata for categorizing a hierarchical ordering for the title for the video content;

(b) converting the content uploaded to the Web-based content management server into a standard TV digital format used by the discrete digital TV service provider network and storing a “local instance” thereof at a video ID (VID) address in a video content database of the VOD platform, wherein the VID address is linked to the title for the video content;

(c) listing the title of the video content in an electronic program guide for the VOD platform of the discrete digital TV service provider using the same hierarchically-arranged categories and subcategories as used in the uploaded metadata for the hierarchical address for the video content in the electronic program guide of the VOD platform;

(d) providing a TV service subscriber, having a TV-equipment-connected set-top box connected to the VOD platform of the discrete digital TV service provider network, with access to the electronic program guide for the VOD platform for navigating through the hierarchically-arranged titles of video content by categories and subcategories therein in order to find the title of the video content desired for viewing on their TV equipment; and

(e) upon the TV service subscriber selecting, via their TV remote control unit in communication with the set-top box, the title for the video content from the hierarchically-arranged categories and subcategories of the electronic program guide, and the set-top box transmitting a request for the selected title to the VOD platform, then enabling retrieval of the selected video content stored at the VID address in the video content database of the VOD platform linked thereto, and transmission of the selected video content to the TV service subscriber's set-top box for display on the TV service subscriber's TV equipment.

'336 patent, cl. 1.

#### **D. The '388, '750, '751, and '026 Patents.**

After the Hawaii court invalidated the '336 patent, BBiTV filed the applications for the '388, '750, '751, and '026 patents, each claiming priority to the '192 application and listing Milton Diaz Perez as the sole inventor. ECF Nos. 113-1 through 113-5 at Covers.

The '026 patent shares a common specification with the '336 patent. The '388, '750 and '751 patents share a common specification, which is the same as the '026 patent specification, except it omits two embodiments: an Internet protocol television ("IPTV") embodiment and a multiple content sources embodiment. ECF No. 113-5 ('026 patent) at 13:65-22:4.

Each specification describes that TV viewers can access video on-demand ("VOD") content using a TV set-top box. ECF No. 113-2 ('388 patent) at 6:12-26. According to the specification, viewers can use a set-top box to access a hierarchical menu of categories and subcategories to navigate to a desired video. *Id.* at 6:38-55. The menu may be generated using "templates." *Id.* at 3:13-50.

To prepare the collection of VOD titles made available to the viewers, the VOD service provider uses a server called "Content Management System" to receive video content from content providers. *Id.* at 9:44-51. The content provider can also supply "metadata," information for classifying the content by title and topic. *Id.* This information ultimately determines the hierarchical structure of the menu shown on the viewers' TV screens. *Id.* at 10:52-56.

Claim 1 of the '388 patent is reproduced below:

1. A set-top box, providing video-on-demand services and operatively connected to TV equipment of a TV service subscriber, programmed to perform the steps of:

(a) receiving, at the set-top box, via a closed system from a video-on-demand content delivery system comprising one or more computers and computer-readable memory operatively connected to the one or more computers, respective video-on-demand application-readable metadata that is associated with respective video content and is usable to generate a video-on-demand content menu;

wherein the respective video content was uploaded to a Web-based content management system by a respective content provider device associated with a respective video content provider via the Internet in a digital video format along with respective specified metadata including respective title information, category information, and subcategory information designated by the respective video content provider to specify a respective hierarchical location of a respective title of the respective video content within the video-on-demand content menu displayed on the TV equipment, wherein the respective video-on-demand application-readable metadata is generated according to the respective specified metadata;

(b) providing, to the TV subscriber at the set-top box, the video-on-demand content menu for navigating through titles, including the respective titles of the respective video content, in a drill-down manner by category information and subcategory information in order to locate a particular one of the titles whose associated video content is desired for viewing on the TV equipment, wherein the video-on-demand content menu lists the titles using the same hierarchical structure of respective category information and subcategory information as was designated by the respective video content provider in the respective specified metadata for the respective video content, wherein a plurality of different video display templates are accessible to the set-top box, and wherein the video-on-demand content menu is generated using at least one of the plurality of different video display templates and based at least upon the respective specified metadata; and

(c) in response to the TV service subscriber selecting, via a control unit in communication with the set-top box, a first respective title associated with a first video content from the hierarchical structure of respective category information and subcategory information of the video-on-demand content menu using drill-down navigation, transmitting the selection to the set-top box for display on the TV equipment; and

(d) receiving, at the set-top box, the first video content for display on the TV equipment of the TV service subscriber, wherein in response to the selection the first video content was retrieved from a video server associated with the video-on-demand content delivery system.

*Id.*, cl. 1.

Claim 1 of the '026 patent also claims a technique of “Drill Down Navigation” of an EPG (identified through underlining below):

enable[s] a subscriber using the Internet-connected digital device to navigate in a drill-down manner through titles by category information in order to locate a particular one of the titles whose associated video content is desired for viewing on the Internet-connected digital device using the same category information as was designated by a video content provider in metadata associated with the video content . . .



wherein the navigating through titles in a drill-down manner comprises navigating from a first level of the hierarchical structure of the video-on-demand content menu to a second level of the hierarchical structure to locate the particular one of the titles

...

ECF No. 113-5 at 22:20–27, 45–49. Claim 1 of the '026 patent also covers the feature of “Templatized EPG Display” (identified through underlining below) that is used in connection with the “Drill Down Navigation” feature

the Internet-connected digital device being configured to obtain and present to the subscriber an electronic program guide as a templatized video-on-demand display, which uses at least one of a plurality of different display templates to which the Internet-connected digital device has access . . .

wherein the templatized video-on-demand display has been generated in a plurality of layers, comprising:

- (a) a first layer comprising a background screen to provide at least one of a basic color, logo, or graphical theme to display;
- (b) a second layer comprising a particular display template from the plurality of different display templates layered on the background screen, wherein the particular display template comprises one or more reserved areas that are reserved for displaying content provided by a different layer of the plurality of layers; and
- (c) a third layer comprising reserved area content generated using the received video content, the associated metadata, and the associated plurality of images to be displayed in the one or more reserved areas in the particular display template as at least one of text, an image, a navigation link, and a button, . . .

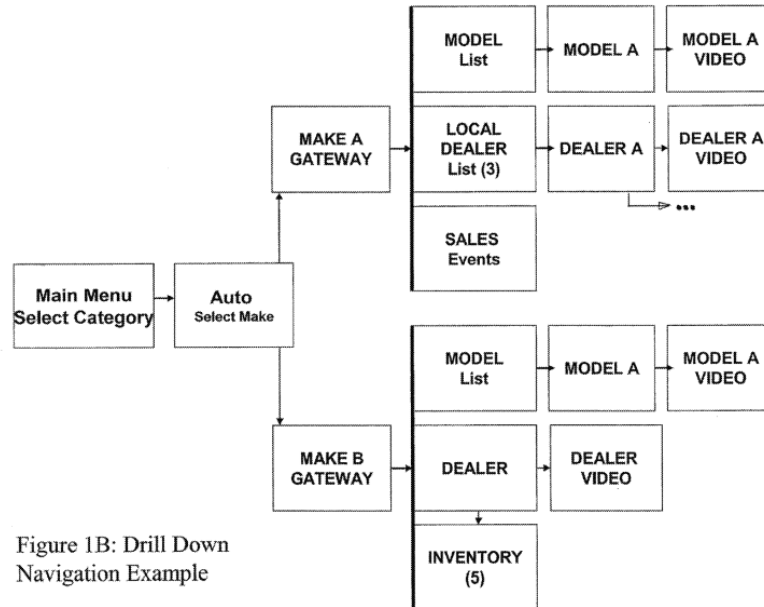
wherein a first template of the plurality of different display templates is used as the particular display template for the templatized display for displaying the first level of the hierarchical structure and wherein a second template of the plurality of different display templates is used as the particular display template for the templatized display for displaying the second level of the hierarchical structure . . .

*Id.* at 22:15–20, 22:15-44, 22:50–57.

The '026 patent discloses a web-based content management system (“WBCMS”) where providers could “greatly expand the content viewable on the VOD platform from studio-generated programs . . . to an infinite universe of authors and publishers connected to upload viewable content . . . via the Internet.” *Id.* at 18:27–31.



An example of Drill Down Navigation is discussed and explained in the specification of the '026 patent: "Through the Gateway, the VOD Application leaves the Menu mode and enters the Drill Down Navigation mode for successively displays of hierarchically-ordered video content which allow the viewer to navigate to progressively more focused content." *Id.* at 6:34–38. FIG. 1B of the '026 patent illustrates an example of Drill Down Navigation in the context of advertisements for cars, and col. 3:58-61 describes how the hierarchical levels of the Drill Down Navigation paths (e.g., Make, Model, Dealer, etc.) correspond to categories provided by content producers in metadata. *Id.* at Fig. 1B, 3:58–61.



The '026 patent at col. 7:18-30 describes an embodiment using the Templatized EPG Display having distinct layers, which is also shown in FIG. 1C:

In FIG. 1C, an example illustrates how a templatized VOD display is generated in layers. A Background screen provides a basic color, logo, or graphical theme to the display. A selected Template (display frame) appropriate to the navigation level the intended display resides on is layered on the Background. The Template typically has a frame in which defined areas are reserved for text, display image(s), and navigation links (buttons). Finally, the desired content constituted by associated Text, Image & Buttons is retrieved from the database and layered on the Template. The resulting screen display shows the combined background logo or theme, navigation frame, and text, video images, and buttons.

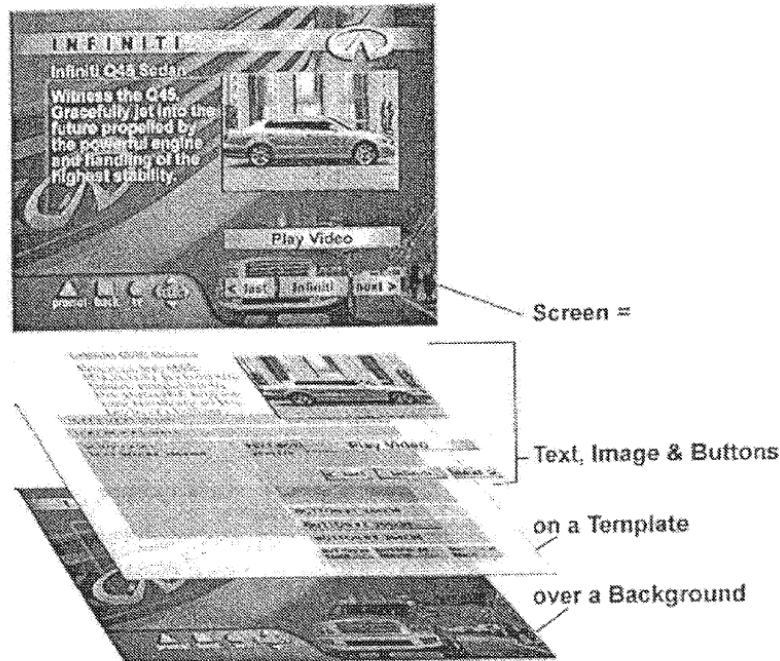


Figure 1C: Template Layer Model

*Id.* at 7:18–30, FIG. 1C. The '026 patent at col. 6:9-20 describes how the Templated EPG Display may be used at one or more levels of the Drill Down hierarchy of the EPG:

In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server 10 retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a “drill down navigation” method to find specific end content of interest.

*Id.* at 6:9–20.

The '750 and '751 patents claims are directed towards a video-on-demand application server system that works in tandem with the WBCMS in which content providers can designate titles, category, and subcategory information to influence how content is presented in an EPG. Claim 1 of both the '750 and '751 patents recite the Templated EPG Display feature in addition

to the WBCMS. Claim 1 of the '751 patent further requires the “Time Availability Metadata” to be provided to the WBCMS to allow the content providers to exert additional control over when their VOD content is to be made available. ECF No. 202 at 12.

Claim 1 of the '388 patent concerns a set-top box operating downstream from a WBCMS, and like the '026, '750, and '751 claims, allows content providers to designate titles, category, and subcategory information to influence how content is presented in an EPG. Claim 1 of the '388 patent recites the Drill Down Navigation and Templatized EPG Displays features and the WBCMS. ECF No. 202 at 13.

### **E. Admissions**

Video-on-demand (“VOD”) is an area of technology that allows a user or subscriber to access TV programming at any time, instead of on a schedule like traditional linear, broadcast TV programs.

The “Background” section in the patents describes the state of technology as of the July 2004 and June 2007—the priority dates for the Asserted Patents. VOD was a “recent type of interactive television service offered on digital TV systems . . . wherein a viewer can navigate through a program guide via the remote control unit and send a request via the set-top box for a desired video program to be addressed from the head-end to the subscriber’s set-top box for display on the TV.” ECF No. 113-2 at 1:58-64.

Although “recent,” the Background explains that “Cable television (CATV) systems” were already used for “a vast majority of TV-viewing homes in the U.S,” and “‘video-on-demand’ (VOD) system” was already a “primary type of interactive television system.” '388 patent at 1:57-2:15. At that time, “[c]urrent VOD ads and program offerings are generally produced for mass audiences. It would be particularly desirable to adapt a VOD delivery platform to deliver ads,

promotions, programs, and informational content.” *Id.* at 2:61-63. The background further explains:

A primary type of interactive television system is referred to generally as a “video-on-demand” (VOD) system, wherein a viewer can enter a selection choice for a video program via the remote control unit to the set-top box and have the desired video program delivered instantaneously for display on the TV. Such VOD applications can include on-demand movies, documentaries, historic sports events, TV programs, infomercials, advertisements, music videos, short-subjects, and even individual screen displays of information. VOD-based interactive television services generally allow a viewer to use the remote control to cursor through an on-screen menu and select from a variety of titles for stored video programs for individual viewing on demand. Advanced remote control units include button controls with VCR-like functions that enable the viewer to start, stop, pause, rewind, or replay a selected video program or segment. In the future, VOD-based interactive television services may be integrated with or delivered with other advanced interactive television services, such as webpage browsing, e-mail, television purchase (“t-commerce”) transactions, and multimedia delivery.

With the increasing interactive functionality and customer reach of interactive television services, advertisers and content providers are find it increasingly attractive to employ on-demand advertising, program content, and TV transactions for home viewers. VOD content delivery platforms are being designed to seamlessly and conveniently deliver a wide range of types of advertising, content, and transaction services on demand to home viewers.

*Id.* at 2:9–35.

The named inventor of the asserted patents, Mr. Diaz, admitted that he did not invent the “cable” system or “VOD program guides” of the patents. ECF No. 152-5 (Diaz July 29, 2015 Tr.) at 492:12-14.

BBiTV’s expert on infringement, Dr. Hugh Smith, admitted that Mr. Diaz did not invent “cable television distribution system[s],” “video on demand,” or “electronic program guide[s].” ECF No. 152-4 (Smith Tr.) at 19:25-20:18, 28:3-7.

Mr. Diaz admitted that at the time of his alleged invention the Web-based content management system referenced in the ’388, ’750, ’751, and ’026 patents was available “off the market.” ECF No. 111-6 (Diaz July 30, 2015 Tr.) at 776:19-777:4.

Dr. Smith also admitted that “there would have been sites that allowed for video to be uploaded over the web” in the 1990s, and Mr. Diaz’s alleged invention did not improve web browsers or “how video content is compressed and then uploaded in packets over the web.” ECF No. 152-4 (Smith Tr.) at 38:1-39:9.

The specification of the ’825 patent states: “Hierarchical addressing is already well familiar to computer users through the hierarchical ordering of files stored in layers of folders on computers.” ’825 patent at 17:51-54. The specification of the ’026 patent similarly states: “The hierarchical addressing string of terms resembles URL addressing commonly used on the Internet.” ’026 patent at 17:52-53. The specification of the ’026 patent states: “Typically, the publisher will select the categories and subcategories for categorizing the title of the video content from a standard categorization hierarchy . . . .” *Id.* at 3:61-64.

Mr. Diaz admitted that he did not invent “hierarchical categories and subcategories.” ECF No. 152-2 (Diaz July 30, 2015 Tr.) at 774:15-18. Smith admitted that Procter & Gamble already had a hierarchically organized inventory user interface in the 1980s. ECF No. 152-4 (Smith Tr.) at 18:8-19:24. Dr. Smith also admitted that Mr. Diaz did not invent the idea of “moving through data . . . in a drill down manner.” *Id.* at 26:2-7.

The specification of the ’388 patent states that a “template” is “an interactive television screen design.” ’388 patent at 11:3-5. One can obtain templates off-the-shelf from “a template design firm.” *Id.* at 7:62-67. BBiTV’s expert on validity, Dr. Shamos, admitted that the purpose of templates is to “maintain[] a consistent look.” ECF No. 111-2 (Shamos Rep.), ¶ 1063. Dr. Smith admitted that “[t]emplates were a known entity” at the time of the alleged invention. ECF No. 152-4 (Smith Tr.) at 26:11-17.

The Templatized EPG Display standardizes the display of uploaded information, such as titles and cover art, at different levels of the Drill Down hierarchy and, because the use of templates, further minimizes the burden on the digital TV service provider to accommodate the increase in the amount of content made available on-demand, while ensuring that subscribers are not forced to scroll through endless and unformatted lists of content. ECF No. 202 at 11.

### III. ADDITIONAL MATERIAL FACTS

For purposes of summary judgment, the Court adopts the following additional material facts and inferences in favor of BBiTV.

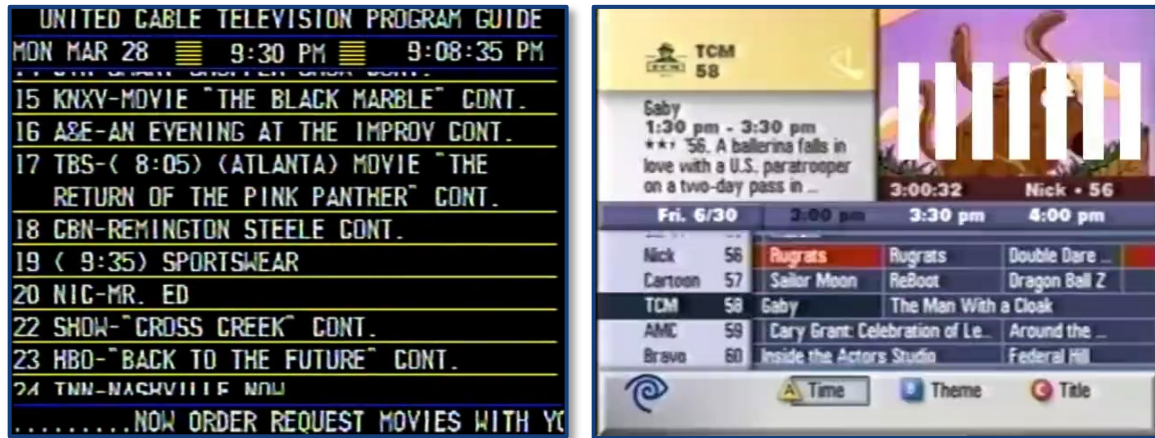
EPG is a specialized type of software computer technology used to locate TV programming in a similar way that an electronic spreadsheet is used to access and manipulate information on a computer. ECF No. 202 at 2.

In 2004, VOD menus included only a few dozen titles. The inventor recognized a problem that while a few dozen titles is manageable for uploading information about the content to the TV provider's system and for viewers to select content of their choice, in the future a menu listing thousands of titles would be difficult to populate and difficult for users to use and navigate. *Id.* at 3. The inventor recognized that it was desirable to find a way for vast numbers of content publishers to transmit their programs to home TV, and to enable home TV viewers to find something of interest for viewing among the vast numbers of new programs. *Id.* The inventor recognized that VOD and EPG technologies could also be improved by enabling large scale expansion of the underlying technology, which is software. *Id.* at 4.

At the time, EPGs, which are a specialized software used in set-top boxes in connection with providing video on demand to viewers, were rudimentary and not well suited for TV providers



to display rapidly growing quantities of movies and information about movies for viewers to select from. Examples of early EPGs are as follows:



*Id.* at 4. The inventor recognized the problems associated with creating an effective EPG -- how VOD content (e.g., movies) and description of content (e.g., information such as title, director, actors, etc.) would be uploaded to TV providers' systems for use populating the EPG without undue labor by the TV provider, and how content and descriptive information about content would be organized and presented in an EPG in the most usable way to assist viewers to navigate the EPG software. *Id.* The inventor's goal in the '026 Patent was to improve the VOD platform by offering a gateway for greatly expanding TV viewing from a relatively small number of studio-produced program channels to a large number of new commercial publishers. *Id.* at 6.

By carrying over the hierarchical address metadata into EPG navigation, the invention allows the content to be automatically listed in the EPG under the common addressing scheme to enable viewers to find any program of interest, relieving the VOD provider of overhead burden. *Id.* This improved how content and information describing content would be uploaded to a TV provider's system for use in an EPG significantly reducing the labor required to arrange the content and descriptive information in an EPG in a usable manner. *Id.*

#### IV. CONCLUSIONS OF LAW

##### A. No Collateral Estoppel Applies

The Court holds that collateral estoppel from *Broadband v. Oceanic* does not prevent BBiTV from defending related patents against § 101 challenges in this case. 135 F. Supp. 3d 1175. These related patents vary sufficiently in their claim scope compared to the '336 patent such that the Court cannot find that the identical issue was previously adjudicated.

Nonetheless, due to the similarity and substantial overlap of the issues, the Court treats *Broadband v. Oceanic*, 135 F. Supp. 3d 1175, as very persuasive authority.

##### B. The Asserted Claims of the '825 Are Directed to an Abstract Idea.

The asserted claims of the '825 patent are directed to the abstract idea of collecting and using a viewer's video history to suggest categories of video content. BBiTV characterization the focus of the '825 patent as “allowing the viewer to zero in on relevant content using a categorical organization scheme based on usage history,” which uses different words to describe this idea. ECF No. 200 (“Aug. 30, 2022 Hearing Tr.”) at 30:15-22.

The claims recite the use of a computer to do what humans—*i.e.*, clerks at video rental stores—have done for years: recommending certain types of videos based on a user's rental history. *See Intell. Ventures I LLC v. Symantec Corp.*, 838 F.3d 1307, 1318 (Fed. Cir. 2016) (holding that “methods of organizing human activity” are abstract ideas); *USC IP*, 2021 WL 6690275, at \*4 (citing analogy to “a librarian identifying books for a student in a school library”). If someone likes Jackie Chan movies, then a video rental store clerk may suggest other similar movies to that person, such as Bruce Lee movies.

The Federal Circuit has held patents directed to collecting information about a user's past behavior and providing content based on that information to be abstract and ineligible under § 101.



*Intellectual Ventures I LLC v. Capital One Bank (USA)*, 792 F.3d 1363, 1369-70 (Fed. Cir. 2015) (holding that “customizing web page content as a function of navigation history and information known about the user” was an abstract idea akin to newspaper inserts tailored based on known information about the customer); *Bridge & Post, Inc. v. Verizon Commc’ns, Inc.*, 778 F. App’x 882, 886-87 (Fed. Cir. 2019) (holding that claim reciting “retrieving historic information for the user [including] patterns of usage,” “generating a user profile based on the historic information,” and “analyzing . . . historic information . . . to determine a directed media component to be provided to the user” was directed to the abstract idea of “tailoring information based on [provided] data”) (citation omitted); *Customedia Techs., LLC v. Dish Network Corp.*, 951 F.3d 1359, 1363 (Fed. Cir. 2020) (holding that “delivering targeted advertising using a computer only as a tool” was ineligible subject matter); *see also BSG Tech LLC v. BuySeasons, Inc.*, 899 F.3d 1281, 1291 (Fed. Cir. 2018) (holding that “considering historical usage information while inputting data” was an abstract idea).

The asserted ’825 patent claims are analogous to those the Federal Circuit held invalid in *Free Stream Media Corp. v. Alphonso Inc.*, 996 F.3d 1355 (Fed. Cir. 2021). The claims at issue in that case recited “(1) gathering information about television users’ viewing habits; (2) matching the information with other content (i.e., targeted advertisements) based on relevancy to the television viewer; and (3) sending that content to a second device.” *Id.* at 1361-62. The Federal Circuit reversed the district court’s ruling of patent eligibility, holding that the claims were directed to the abstract idea of targeted advertising. *Id.* at 1361.

Like the *Free Stream Media* claims, claim 1 of the ’825 patent recites (1) gathering information about television users’ viewing habits (“a log of selection data corresponding to the viewer’s consumption of the video-on-demand programs”); (2) matching the information with an ordered list of category names (“determining . . . an order of relevance of a plurality of category

names” based on the “selection data”); and (3) sending the ordered list to the user (“for said respective individual viewer selection of video-on-demand programs”). The ’825 patent claims are abstract and ineligible for the same reasons cited by the Federal Circuit in *Free Stream Media*.

The Court’s opinion in *USC IP Partnership, L.P. v. Facebook, Inc.*, 576 F. Supp. 3d 446 (W.D. Tex. 2021) is also instructive. The patent at issue there related to helping a website visitor “readily identify and navigate to the pages . . . that correspond to the visitor’s intent.” *Id.* at 451. It disclosed “an intent engine 20 that collects and analyzes intent data from visitors as they browse webpages within a namespace,” and infer intents and generate web page recommendations by “referencing historical intent data.” *Id.* For example, the user could “view and select” from a list of recommendations in the form of “a dropdown menu,” where the first item was a webpage “most likely to provide the information that the visitor is seeking.” *Id.* at 453.

This Court granted summary judgment of invalidity under § 101 in *USC IP*, holding the claims were directed to the abstract idea of “collecting, analyzing and using intent data.” *Id.* at 456. The Court noted that “finding information that matches the user’s intent [] is a longstanding problem that existed long before the advent of computers and is not unique to the Internet.” *Id.* at 455. Despite reciting a black box “intent engine,” the claims provided “no explanation of how ‘processing’ steps are performed or how it causes the intent engine to determine an ‘inferred intent’ or ‘at least one recommended webpage.’” *Id.* at 455-46.

In the ’825 patent, the usage history database collects “the viewer’s consumption of the video-on-demand programs,” similar to the “intent data” collected in *USC IP*. ’825 patent, cl. 1. The TV service provider system then determines “an order of relevance of a plurality of category names” to show the user, similar to the ranked “drop down menu” of recommendations in *USC IP*. *Id.* Like the black box “intent engine” in *USC IP*, the asserted claims of the ’825 patent do not

explain *how* to generate the ranked categories based on usage data—they claim the bare result of doing so. The asserted claims of the ’825 patent are thus directed to an abstract idea.

Many courts have held patents directed to collecting information about a user’s past behavior and providing content based on that information to be abstract and ineligible. *See, e.g., OpenTV, Inc. v. Netflix Inc.*, 76 F. Supp. 3d 886, 893-94 (N.D. Cal. 2014) (holding that “a method and system for profiling online users . . . based on their observed [internet] surfing habits and for selectively delivering content” in the form of a “dynamically generated” “individual list of items” was directed to an abstract idea); *Netflix, Inc. v. Rovi Corp.*, 114 F. Supp. 3d 927, 946 (N.D. Cal. 2015) (holding that “a system and method for providing personal recommendations based on a user’s viewing history” was directed to an abstract idea), *aff’d*, 670 F. App’x 704 (Fed. Cir. 2016); *Morsa v. Facebook, Inc.*, 77 F. Supp. 3d 1007, 1013 (C.D. Cal. 2014) (“[M]atching consumers with a given product or service ‘has been practiced as long as markets have been in operation.’”) (citation omitted), *aff’d*, 622 F. App’x 915 (Fed. Cir. 2015); *Sound View Innovations, LLC v. Facebook, Inc.*, 204 F. Supp. 3d 655, 662 (D. Del. 2016) (holding that “offering more meaningful information to an individual based on his own preferences” and the preferences of others was an abstract idea).

The ’825 patent claims are not directed to a new or improved graphic user interface. The claims simply require display of a generic list of categories and provide no other detail about the claimed interface. The Federal Circuit has held similar user interface claims ineligible. *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1234, 1241-43 (Fed. Cir. 2016) (invalidating under § 101 claim reciting a menu including “menu categories” and “menu items”). *Core Wireless* and *Data Engine* do not apply to this case. The claim in *Core Wireless* improved the user interface to show summary data even for an application “in an un-launched state.” *Core Wireless Licensing S.A.R.L.*

*v. LG Elecs., Inc.*, 880 F.3d 1356, 1362-63 (Fed. Cir. 2018). The claim in *Data Engine* improved the user interface by adding a “notebook tab” to navigate between spreadsheet pages. *Data Engine Techs. LLC v. Google LLC*, 906 F.3d 999, 1008 (Fed. Cir. 2018). These cases teach that a claim to a user interface must describe a specific structure improving the interface itself. *Id.* at 1010-11. Here, however, the ’825 patent claims a generic list of categories, such as shown in its Figure 5. This category list does not improve the interface of existing electronic program guides in any meaningful way.

The Court recognizes that the VOD and EPG are a “specialized type of software computer technology.” ECF No. 202 at 2. However, the claims merely implement abstract ideas in software without improvements to or unconventional combinations of underlying hardware.

Thus, at *Alice* step one, the asserted claims of the ’825 patent are directed to the abstract idea of collecting information about a user’s viewing history and using that information to present categories of video content.

### **C. The Asserted Claims of the ’825 Do Not Recite Any Inventive Concept or Technological Improvement.**

The asserted claims of the ’825 patent do not recite any inventive concept at *Alice* step two. The ’825 patent admits that tracking systems that could collect the users’ viewing history were “conventional.” ’825 patent at 7:28-38. The claims recite conventional databases for storing data, conventional servers for processing data, and conventional televisions for displaying data.

First, BBiTV contends that the claimed invention improves EPG and VOD software. The ’825 inventor sought to implement a categorization scheme, allowing the EPG to present the VOD content by category, and further individualizing the EPG based on usage history and presenting the categories in an order of relevance based on the viewing history

That the computerized process claimed in the '825 patent could purportedly streamline the manual recommendation process or handle a larger selection of titles does not make the claims any less abstract. *See Capital One*, 792 F.3d at 1367 (“[S]imply appending generic computer functionality to lend speed or efficiency to the performance of an otherwise abstract concept does not meaningfully limit claim scope for purposes of patent eligibility.”) (citation omitted); *id.* at 1370 (“[T]he fact that the web site returns the pre-designed ad more quickly than a newspaper could send the user a location-specific advertisement insert does not confer patent eligibility.”); *see also OIP Techs., Inc. v. Amazon.com, Inc.*, 788 F.3d 1359, 1362-64 (Fed. Cir. 2015) (“[R]elying on a computer to perform routine tasks more quickly or more accurately is insufficient to render a claim patent eligible.”). The inventor may have recognized a business need to scale up a laborious process by using computers to process categories of data, but merely implementing an existing process on a computer to realize the inherent computational power of computers is not an inventive concept. *See Alice*, 573 U.S. 208.

The '825 patent also does not disclose or claim any improvement to database technology. The claimed electronic program guide database and usage history database are generic databases without any particular, let alone improved, structure. *See* '825 patent at 20:58-67. The databases of the '825 patent merely “provide[] a generic environment in which the claimed method is performed.” *BSG Tech*, 899 F.3d at 1286; *see also Capital One*, 792 F.3d at 1371 (listing “database” as an example of “conventional computer components”); *Netflix*, 114 F. Supp. 3d at 946-47 (finding that “viewing history database” and “program listing database” were no different from a generic computer). Aside from the databases, the Court can discern no meritorious argument about any other improvement hardware. BBiTV’s arguments about the VOD and EPG are arguments about software.

Similarly, the '825 patent does not disclose or claim any new way of, or technological improvements to, the concept of logging in or starting new sessions. Claim 1 recites reordering the categories “at the start of each new session when said respective individual viewer logs onto their respective viewer-individualized electronic program guide.” '825 patent, cl. 1. This claim element invokes logging in as a generic way to identify a user, which is ancillary to the overall goal of providing an individualized program listing. *See OpenTV*, 76 F. Supp. 3d at 894 (claim directed to an abstract idea despite reciting “wherein said individual list is dynamically generated for each user on user login”).

Counsel for BBiTV argued at the hearing that “rebuild[ing] the electronic program guide menu, selectively reordering how that information is presented” is a technological improvement. Aug. 30, 2022 Hearing Tr. at 31:5-18, 44:12-21. But taking a list and changing the order of entries on that list could be performed by a human with paper and a pencil; this is not a technological improvement. *Synopsys, Inc. v. Mentor Graphics Corp.*, 839 F.3d 1138, 1139 (Fed. Cir. 2016) (holding that claims are directed to an abstract idea where the idea could be “performed mentally or by pencil and paper,” and the claims do not involve “an improvement in the computer as a tool.”).

BBiTV argues that the '825 patent discloses a purportedly inventive “two-database architecture,” but it does not specify any unconventional way in which the patent uses generic databases. ECF No. 133 at 16. The specification does not explain any benefit of using two databases instead of one. The two databases are just conventional databases with functional names. *See Dropbox, Inc. v. Synchronoss Techs., Inc.*, 815 F. App'x 529, 532-33 (Fed. Cir. 2020) (holding that “functional abstraction” of a “black box” does not define a technological solution); *Netflix*, 114 F. Supp. 3d at 946-47 (finding that “functional descriptors” of “viewing history

database” and “program listing database” did not make generic databases “something more particular”).

When considering the claimed elements as an ordered combination, the claims still lack an inventive concept. BBiTV argues that “combin[ing] individualization with [a] categorization scheme” is an inventive concept. ECF No. 133 at 15-16. BBiTV’s alleged inventive concept is simply a restatement of the abstract idea itself: using viewing history information to present categories of content. Combining two abstract ideas—categorization and individualization—is not inventive. *See RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017) (“Adding one abstract idea . . . to another abstract idea . . . does not render the claim non-abstract.”).

When considering the ordered combination of a login process and recommending content, the claims still lack an inventive concept. The claims invoke databases and a login process in a logical order to achieve the goal of recommending content based on viewing history. The viewing history data must be stored somewhere, and a database located at a server is a conventional solution. Further, users must be able to identify themselves, and logging in is existing technology for doing so. The recited limitations are inherent and logically required to accomplish the abstract idea. Continuing the earlier video store clerk analogy, the login process is like seeing a patron returning in through the doors of the video store with the Jackie Chan movie—an event that naturally proceeds the clerk recommending a Bruce Lee movie.

The asserted dependent claims are also non-inventive. Dependent claim 10 allows users to identify themselves by “select[ing] their name from a list of previously registered viewers.” ’825 patent, cl. 10. This claim describes a process of automating the input of user names, and “mere automation of manual processes using generic computers does not constitute a patentable

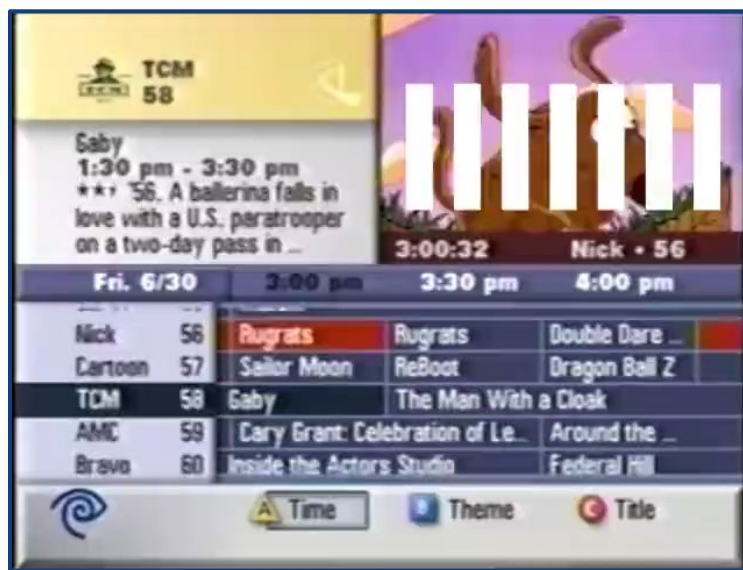




**D. The Asserted Claims of the '388, '750, '751, and '026 Patents Are Directed to an Abstract Idea.**

The asserted claims of the '388, '750, '751, and '026 patents are directed to the abstract idea of receiving hierarchical information and organizing the display of video content. The focus of these claims is (1) receiving video content and associated metadata from a content provider, and (2) displaying titles hierarchically at a client device according to the provided metadata. In other words, this directed to a computerized implementation of the business process of receiving video content and information from people who want to show videos, such as using an intake form or template, and then using that form/template information to present to viewers a hierarchy of information about available videos.

An example of an early EPG is shown below. It includes information that a content provider would need to give or that the TV guide provide would need to obtain, such as the title of the video content, the time for showing the video, the channel, theme, and a description of the video.



ECF No. 202 at 4. The problem was that parties were providing, receiving, and processing this information in a laborious way. *See id.* Using a computer to receive and process this information in a standardized format allowed people to realize the inherent computational power of computers to do it faster and at scale.

The Federal Circuit’s decision in *In re TLI Communications. LLC Patent Litigation*, 823 F.3d 607, 610-11 (Fed. Cir. 2016) makes clear that the asserted claims of the ’388, ’750, ’751, and ’026 patents are abstract. The claim in *TLI* recited recording images in a telephone, transmitting the images along with “classification information” to a server, extracting the “classification information,” and storing the images in the server according to the “classification information.” *Id.* at 610. The Federal Circuit held that the claim was directed to the abstract idea of “classifying an image and storing the image based on its classification.” *Id.* at 612. Like the claims in *TLI*, which recited the sending of classification information along with images, here the asserted claims require a content provider to upload metadata including category information for organizing the uploaded content.

In addition to uploading metadata and video content, the claims here also recite organizing video titles by displaying them in a hierarchical manner. In *Ameranth*, the patent at issue described a digital menu for use in the restaurant industry, including “categories such as appetizers and entrees [and] items such as chicken Caesar salad.” 842 F.3d at 1235. The claim recited “menu categories” and “menu items,” “displayable in a window of said graphical user interface in a hierarchical tree format.” *Id.* at 1234. The Federal Circuit held that the claim reciting the “hierarchical tree format” was directed to an abstract idea, and the same is true here. *See id.* at 1241; *see also EMG Tech., LLC v. Etsy, Inc.*, No. 6:16-CV-00484-RWS-JDL, 2017 WL 6261810,

at \*6 (E.D. Tex. Jan. 25, 2017) (holding that “displaying information in a hierarchical tree format on a computer screen” was an abstract idea).

The claims of the asserted patents are not directed to a new and improved graphic user interface. *Core Wireless, Data Engine*, and *Trading Technologies* do not apply here. While the claims in those cases provided specific structures to improve the user interfaces—an application summary showing data “in an un-launched state,” *Core Wireless*, 880 F.3d at 1362-63, a “notebook tab” to navigate between spreadsheet pages, *Data Engine*, 906 F.3d at 1008, and a pair of “dynamic display” and “static display,” *Trading Techs. Int’l, Inc. v. CQG, INC.*, 675 F. App’x. 1001, 1003 (Fed. Cir. 2017)—here organizing information in a hierarchy is a longstanding human practice whether it is performed on a piece of paper or on a TV screen.

The claims also recite a “Web-based content management system” or WBCMS as a server system that receives the video content and the metadata from content providers. The claims, however, do not specify how the “Web-based” interface should operate or what “management” tasks are accomplished. Rather, they recite the WBCMS as a conduit of information over the Internet. Therefore, the WBCMS is a generic server to carry out “data collection, recognition, and storage” tasks—quintessential functions of a server. *See Content Extraction*, 776 F.3d at 1347. Using existing Web or Internet technology does not transform that server into eligible subject matter, as “the use of the Internet is not sufficient to save otherwise abstract claims from ineligibility under § 101.” *Ultramercial, Inc. v. Hulu, LLC*, 772 F.3d 709, 716 (Fed. Cir. 2014); *see also Capital One*, 792 F.3d at 1370 (finding that an “interactive interface that manages web site content” did not confer eligibility because it “simply describes a generic web server with attendant software”).

With respect to “templates,” as discussed above, BBiTV has repeatedly confirmed that templates are just a generic environment to implement the claimed EPG, and courts have found templates to be an abstract concept. The use of templates is ancillary to the overall goal of displaying titles hierarchically in an EPG. Adding that concept does not save the claims under *Alice*. See *RecogniCorp, LLC v. Nintendo Co.*, 855 F.3d 1322, 1327 (Fed. Cir. 2017) (“Adding one abstract idea . . . to another abstract idea . . . does not render the claim non-abstract.”). Moreover, the use of templates to intake information is a routine and conventional practice.

The Court recognizes that the VOD and EPG are a “specialized type of software computer technology.” ECF No. 202 at 2. However, the software itself merely implements abstract ideas without improvements to or new combinations of underlying hardware.

Therefore, at step one of *Alice*, the asserted claims of the ’388, ’750, ’751, and ’026 patents are directed to the abstract idea of receiving hierarchical information and organizing the display of video content accordingly.

**E. The Asserted Claims of the ’388, ’750, ’751, and ’026 Patents Do Not Recite Any Inventive Concept.**

The asserted claims of the ’388, ’750, ’751, and ’026 patents lack an inventive concept because they recite only generic and conventional components, arranged in a conventional manner, and provide only conventional functionalities.

The claimed WBCMS is a generic server for “data collection, recognition, and storage” using the existing Internet. See *Content Extraction*, 776 F.3d at 1347. Mr. Diaz admitted that at the time of his alleged invention the WBCMS was available “off the market.” ECF No. 111-6 (Diaz July 30, 2015 Tr.) at 776:19-777:4. BBiTV’s expert also admitted that “there would have been sites that allowed for video to be uploaded over the web” in the 1990s, and Mr. Diaz’s alleged

invention did not improve web browsers or “how video content is compressed and then uploaded in packets over the web.” ECF No. 152-4 (Smith Tr.) at 38:1-39:9. Such admissions preclude any factual dispute as to whether a WBCMS is conventional at *Alice* step two. *See, e.g., Berkheimer v. HP Inc.*, 881 F.3d 1360, 1370 (Fed. Cir. 2018) (finding certain claims ineligible based on inventor’s admission that “parsers and the functions they perform existed for years before his patent”); *see also Elec. Power Grp.*, 830 F.3d at 1355 (finding no inventive concept where “[n]othing in the claims, understood in light of the specification, requires anything other than off-the-shelf, conventional computer, network, and display technology”).

The Hawaii Court expressly found WBCMS to be conventional at *Alice* step two. *Broadband v. Oceanic*, 135 F. Supp. 3d at 1192–94 (D. Haw. 2015). This is important because BBiTV has described the ’336 patent as “directed to . . . the web-based content management system.” Aug. 30, 2022 Hearing Tr. at 21:24-22:10. This Court is persuaded by the reasoning of the Hawaii Court and similarly finds that the use of a WBCMS not an inventive concept.

Hierarchical navigation and the use of templates cannot provide the inventive concept, either; as discussed above, they are fundamental human practices that courts have long held to be abstract. “[T]he abstract idea itself . . . cannot supply the inventive concept that renders the invention significantly more than that ineligible concept.” *ChargePoint, Inc. v. SemaConnect, Inc.*, 920 F.3d 759, 774 (Fed. Cir. 2019) (internal quotations and citation omitted).

Indeed, the specification of the ’825 patent confirms: “Hierarchical addressing is already well familiar to computer users through the hierarchical ordering of files stored in layers of folders on computers.” ’825 patent at 17:51-54. The specification of the ’026 patent added: “The hierarchical addressing string of terms resembles URL addressing commonly used on the Internet.” ’026 patent at 17:52-53. Mr. Diaz admitted that he did not invent “hierarchical categories and

subcategories.” ECF No. 152-2 (Diaz July 30, 2015 Tr.) at 774:15-18. BBiTV’s expert also admitted that Procter & Gamble already had a hierarchically organized inventory user interface in the 1980s. ECF No. 152-4 (Smith Tr.) at 18:8-19:24.

The asserted claim elements are also non-inventive when considered as an ordered combination. The discrete WBCMS, drill down navigation, and templated VOD displays features do not combine in an unconventional way. Instead, they describe a logical sequence of handling information: WBCMS for collecting information, drill down navigation for organizing information, and templated VOD displays for presenting information. They all perform their intended functions in a conventional way to implement the abstract idea. Drilling down through categories of information is not something unique to a user interface and does not solve a problem inherently rooted in computer technology.

None of the dependent claims recite any inventive concept either. Claim 13 of the ’388 patent, claim 8 of the ’750 patent, and claim 8 of the ’751 patent each recite a “templated video-on-demand display” comprising a “background” and “areas” for displaying metadata. Claim 3 of the ’751 patent recites “different display templates” corresponding to “different levels of the hierarchical structure.” Similar to the three-layer structure in the ’026 patent, the additional specificities regarding templates do not alter the abstract nature of the template concept.

Claim 17 of the ’388 patent recites a “search interface” to search video content. But “using [an] index to search for and retrieve data” is also an abstract idea. *Intellectual Ventures I LLC v. Erie Indem. Co.*, 850 F.3d 1315, 1328 (Fed. Cir. 2017).

Finally, claim 7 of the ’750 patent and claim 6 of the ’026 patent recites “topics” pertaining to “more than one video content provider,” and claim 7 of the ’026 patent recites “category terms” corresponding to “one or more content providers.” Using topics and categories to classify

information is a fundamental human practice. There is also nothing inventive about having multiple content providers instead of one.

Therefore, the asserted claims of the '388, '750, '751, and '026 patents do not recite any inventive concept at step two of *Alice*. The claims are invalid under 35 U.S.C. § 101.

#### **F. No Monopolization**

The Court agrees with BBiTV that the claims do not monopolize or preempt a field of technology or fundamental tool of science. While monopolization is a driving concern behind section 101, BBiTV presents no authority that allows the Court to reach a different decision based on the lack of monopolization alone.

### **V. CONCLUSION**

This is a case where no disputes of material fact hinder summary judgment about what was routine and conventional in the Section 101 context. Instead, the Court relies on a record full of facts from the background of the patents, statements by the plaintiff's witnesses, and statements in the plaintiff's briefs. The Court generally credits BBiTV's arguments that its inventor was the first to implement certain existing business practices on computer systems to make the process faster and scalable, but this alone is insufficient to transform those business practices into something more than a computer implementation of an abstract idea. In this way, the case is like *Alice*, where the claims covered the practice of hedging as implemented on a computer. 573 U.S. 208. Against a background where the Hawaii Court already held similar claims ineligible in a related patent, the patent owner here has not persuaded this Court that differences in the claimed technology require a different outcome.

Defendants' Motion is **GRANTED**. ECF No. 111. The Court holds the '825, '388, '750, '751, and '026 Patents invalid under 35 U.S.C. § 101.

SIGNED this 30th day of September, 2022.



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ALAN D ALBRIGHT  
UNITED STATES DISTRICT JUDGE



**UNITED STATES DISTRICT COURT  
FOR THE WESTERN DISTRICT OF TEXAS  
WACO DIVISION**

**BROADBAND iTV, INC.,**

*Plaintiff,*

v.

**AMAZON.COM, INC.,  
AMAZON.COM SERVICES LLC AND  
AMAZON WEB SERVICES, INC.,**

*Defendants.*

Case No. 6:20-cv-00921-ADA

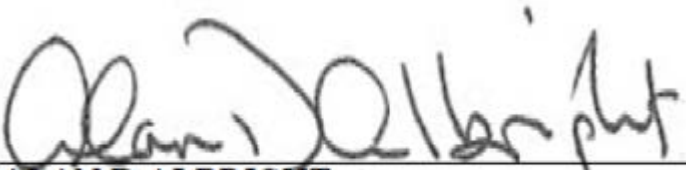
**FINAL JUDGMENT**

On September 30, 2022, the Court entered a Memorandum Opinion and Order (ECF No. 204) that granted Amzon.com, Inc.; Amazon.com Services LLC; and Amazon Web Services, Inc.’s (collectively, “Defendants”) Motion for Summary Judgment of Invalidity under 35 U.S.C. § 101 and held that certain claims U.S. Patent Nos. 9,973,825 (the “’825 patent”), 9,648,388 (the “’388 patent”), 10,536,750 (the “’750 patent”), 10,536,751 (the “’751 patent”), 10,028,026 (the “’026 patent”) are invalid under 35 U.S.C. § 101. Specifically, claims 1, 10, 15 and 17 of the ’825 patent, claims 1, 13 and 17 of the ’388 patent, claims 1, 7 and 8 of the ’750 patent, claims 1, 3 and 8 of the ’751 patent, and claims 1, 6 and 7 of the ’026 patent (collectively, “the Asserted Claims”) were found invalid under 35 U.S.C. § 101.

In accordance with the Memorandum Opinion and Order (ECF No. 204) and pursuant to Rule 54(b) of the Federal Rules of Civil Procedure, it is hereby **ORDERED** and **ADJUDGED** that:

1. All the Asserted Claims are invalid under 35 U.S.C. § 101.
2. This FINAL JUDGMENT starts the time for filing any appeal.

Signed this 24th day of October, 2022.



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ALAN D ALBRIGHT  
UNITED STATES DISTRICT JUDGE

(12) **United States Patent**  
**Perez**

(10) **Patent No.:** **US 10,028,026 B2**  
(45) **Date of Patent:** **\*Jul. 17, 2018**

(54) **SYSTEM FOR ADDRESSING ON-DEMAND TV PROGRAM CONTENT ON TV SERVICES PLATFORM OF A DIGITAL TV SERVICES PROVIDER**

(71) Applicant: **Broadband iTV, Inc.**, Honolulu, HI (US)

(72) Inventor: **Milton Diaz Perez**, Tiburon, CA (US)

(73) Assignee: **Broadband iTV, Inc.**, Honolulu, HI (US)

(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/192,598**

(22) Filed: **Jun. 24, 2016**

(65) **Prior Publication Data**

US 2016/0309232 A1 Oct. 20, 2016

**Related U.S. Application Data**

(60) Continuation of application No. 14/827,090, filed on Aug. 14, 2015, now Pat. No. 9,420,318, which is a (Continued)

(51) **Int. Cl.**  
**H04N 7/18** (2006.01)  
**H04N 7/173** (2011.01)  
(Continued)

(52) **U.S. Cl.**  
CPC ..... **H04N 21/47202** (2013.01); **G06Q 30/02** (2013.01); **H04N 7/17318** (2013.01);  
(Continued)

(58) **Field of Classification Search**  
USPC ..... 725/74–104  
See application file for complete search history.

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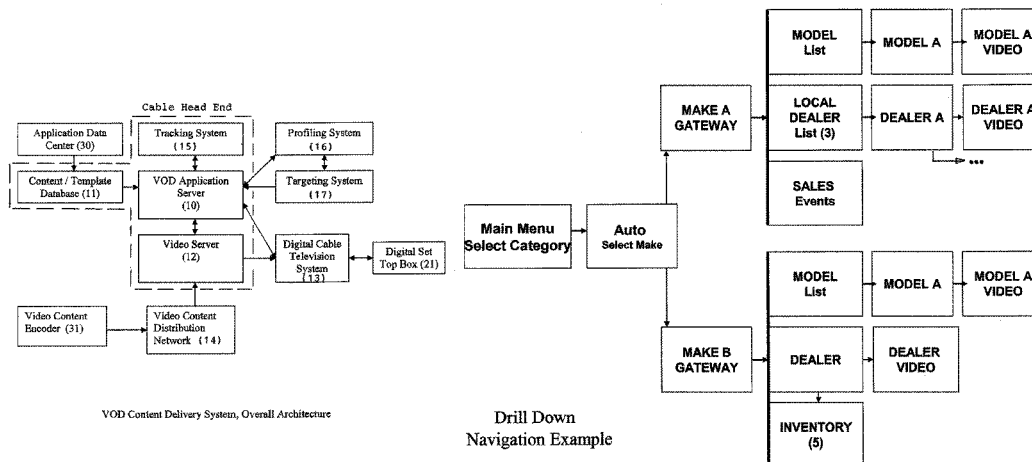
*Primary Examiner* — Mushfikh Alam

(74) *Attorney, Agent, or Firm* — Amster, Rothstein & Ebenstein LLP

(57) **ABSTRACT**

Video content is uploaded via the Internet to a video-on-demand (VOD) server identified by a title and a hierarchical address of categories and subcategories for categorizing the title. The VOD server converts and stores the video content at a storage address in a video content database linked to the title. The title is listed in a location of an electronic program guide (EPG) using the same categories and subcategories as in its hierarchical address. Any TV subscriber can access the EPG and navigate through its categories and subcategories to find a title for viewing on the TV. This can enable many new blogging or podcasting-like programs by popular “Hosts” to be self-published on the Internet and readily navigated for display on TV. The EPG can also store TV program addresses as bookmarks and allow them to be shared with other subscribers or with friends and contacts online by sending to their email addresses.

**17 Claims, 13 Drawing Sheets**



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## Related U.S. Application Data

continuation of application No. 12/632,745, filed on Dec. 7, 2009, now Pat. No. 9,113,228, which is a division of application No. 11/685,188, filed on Mar. 12, 2007, now Pat. No. 7,631,336, which is a continuation-in-part of application No. 10/909,192, filed on Jul. 30, 2004, now Pat. No. 7,590,997.

## (51) Int. Cl.

*H04N 21/472* (2011.01)  
*H04N 21/222* (2011.01)  
*H04N 21/482* (2011.01)  
*H04N 21/462* (2011.01)  
*H04N 21/8545* (2011.01)  
*H04N 21/61* (2011.01)  
*H04N 21/239* (2011.01)  
*H04N 21/258* (2011.01)  
*H04N 21/414* (2011.01)  
*H04N 21/475* (2011.01)  
*G06Q 30/02* (2012.01)  
*H04N 21/2547* (2011.01)  
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*H04N 21/854* (2011.01)  
*H04N 21/4786* (2011.01)

## (52) U.S. Cl.

CPC ..... *H04N 21/222* (2013.01); *H04N 21/239* (2013.01); *H04N 21/2393* (2013.01); *H04N 21/2547* (2013.01); *H04N 21/25875* (2013.01); *H04N 21/25891* (2013.01); *H04N 21/2665* (2013.01); *H04N 21/26291* (2013.01); *H04N 21/41407* (2013.01); *H04N 21/4312* (2013.01); *H04N 21/4345* (2013.01); *H04N 21/4622* (2013.01); *H04N 21/4722* (2013.01); *H04N 21/4753* (2013.01); *H04N 21/4758* (2013.01); *H04N 21/4786* (2013.01); *H04N 21/47214* (2013.01); *H04N 21/482* (2013.01); *H04N 21/4821* (2013.01); *H04N 21/4825* (2013.01); *H04N 21/6125* (2013.01); *H04N 21/6175* (2013.01); *H04N 21/6379* (2013.01); *H04N 21/64322* (2013.01); *H04N 21/812* (2013.01); *H04N 21/84* (2013.01); *H04N 21/8545* (2013.01); *H04N 21/85406* (2013.01)

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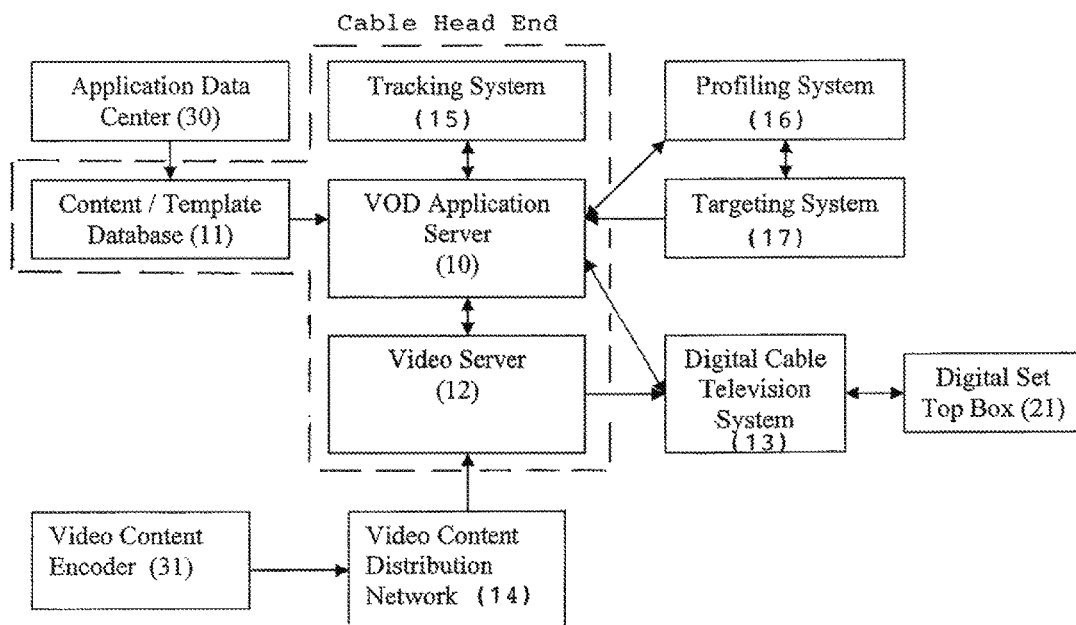


Figure 1A: VOD Content Delivery System, Overall Architecture

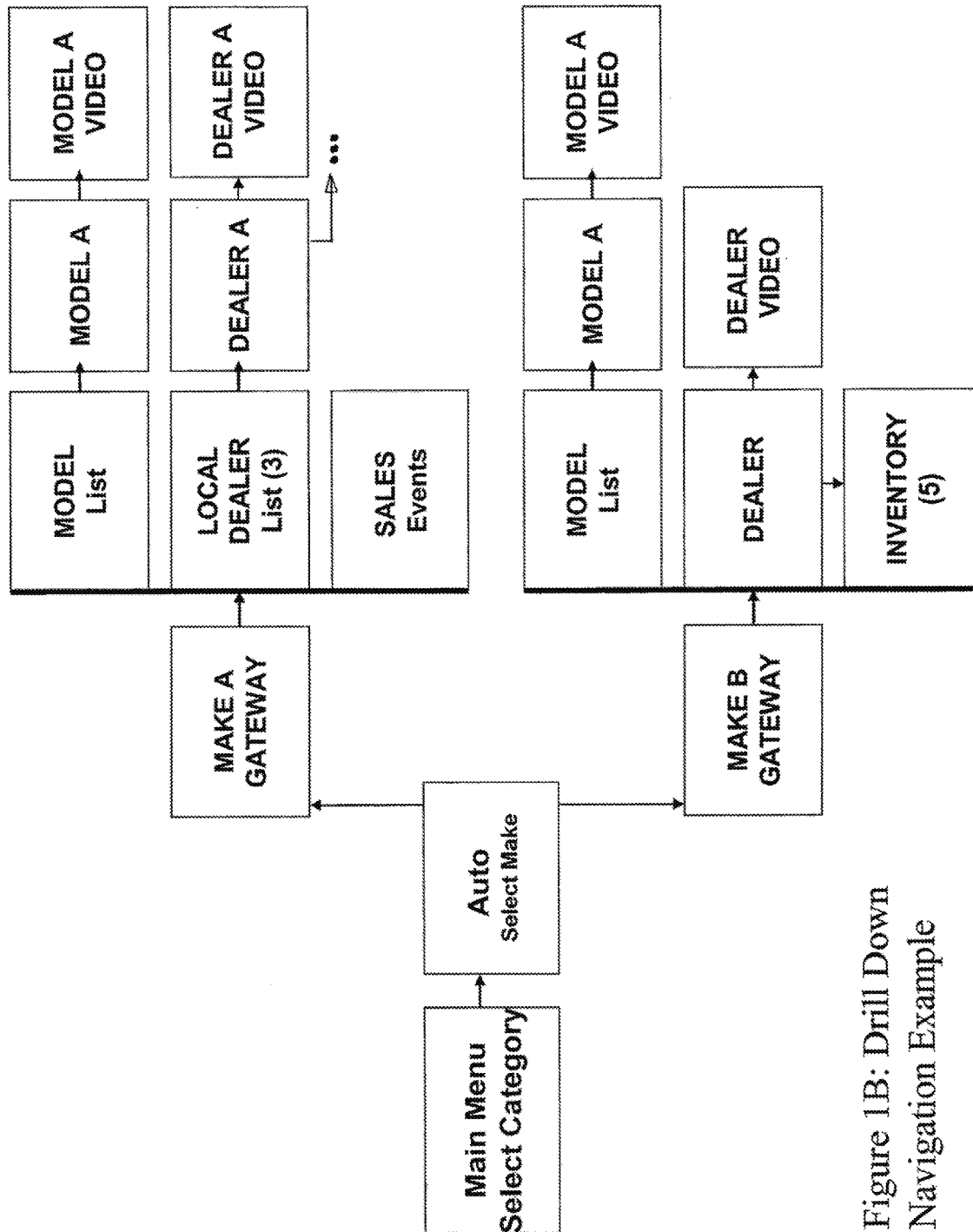


Figure 1B: Drill Down Navigation Example

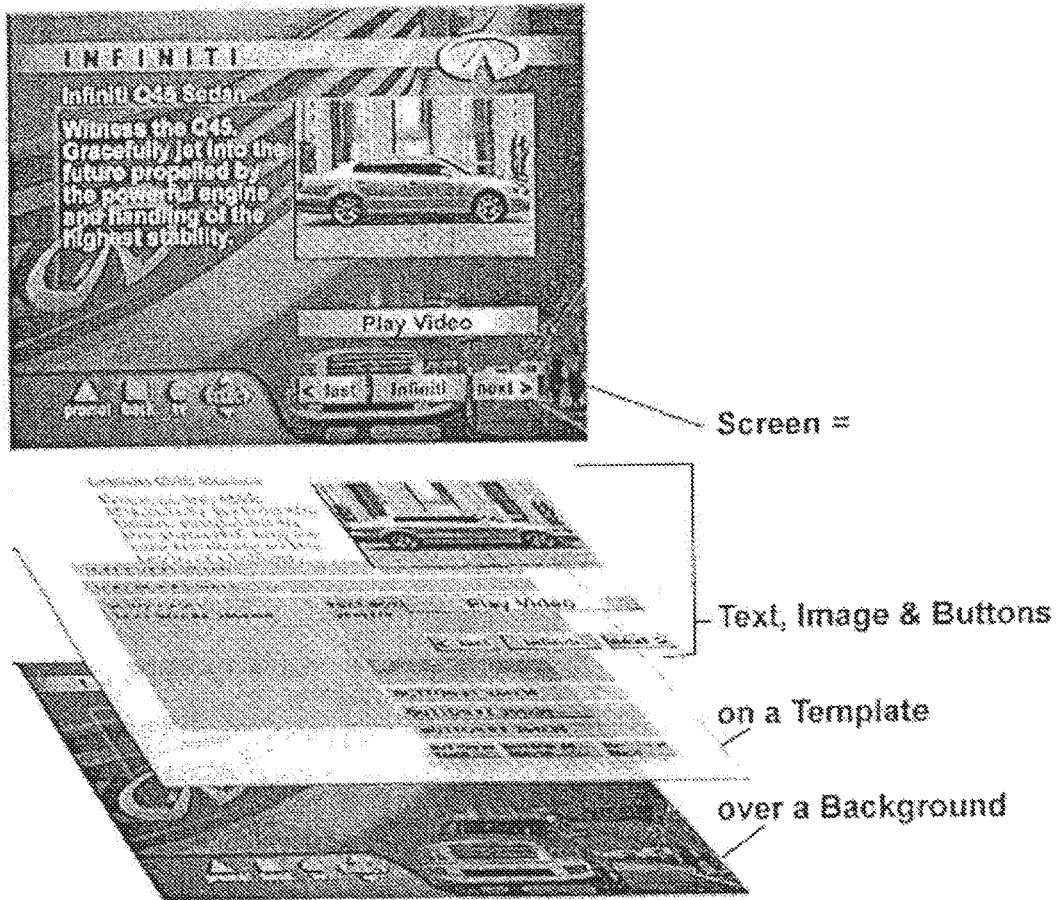


Figure 1C: Template Layer Model

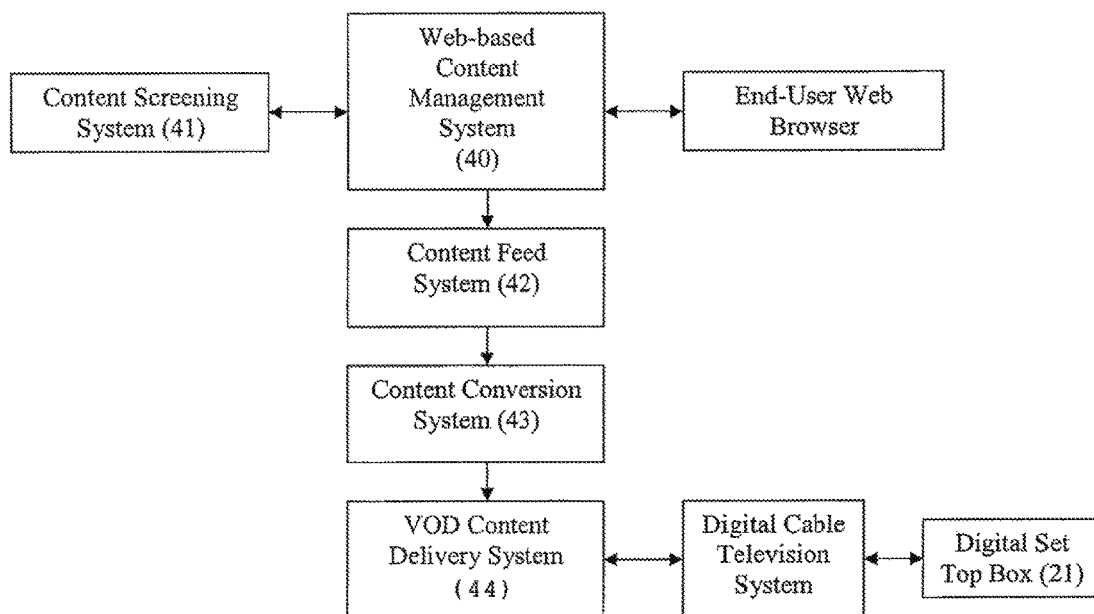


Figure 2A: Classified Ad System, Overall Architecture

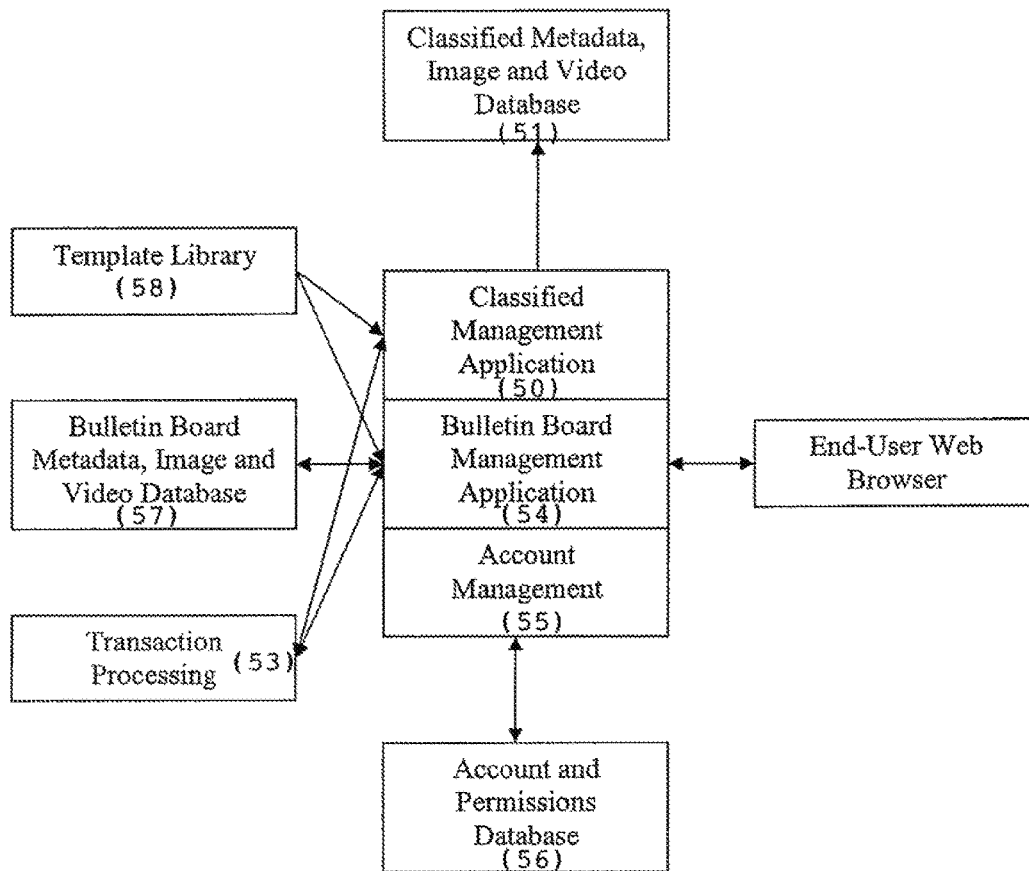


Figure 2B: Web-based Content Management System

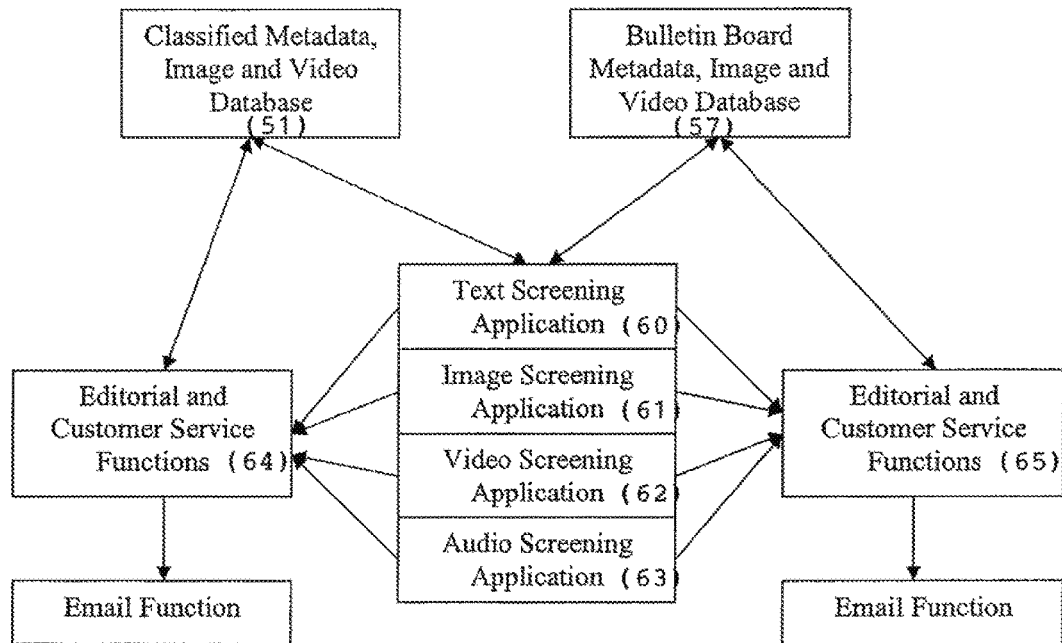


Figure 2C: Content Screening System

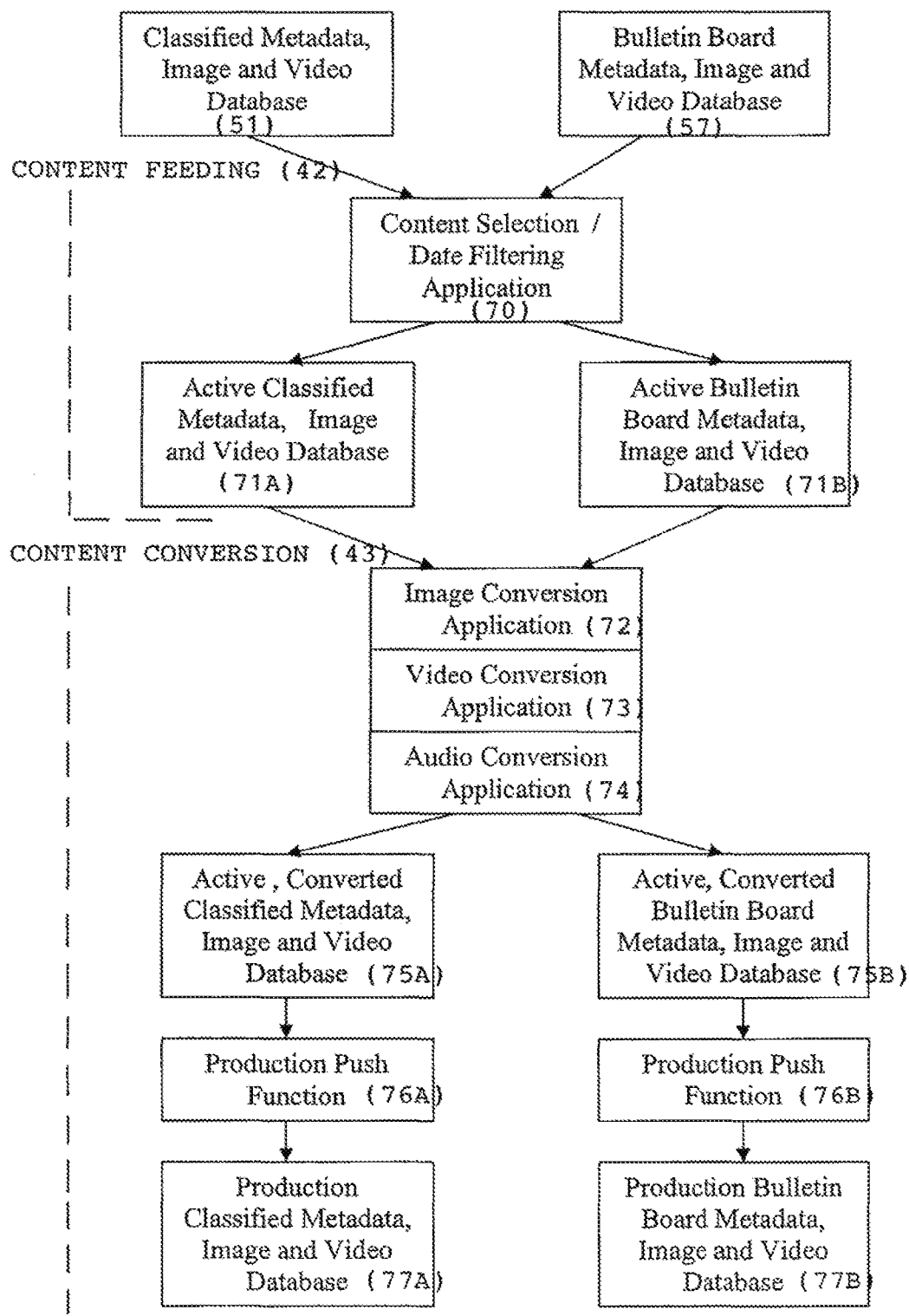


Figure 2D: Content Feed and Conversion System

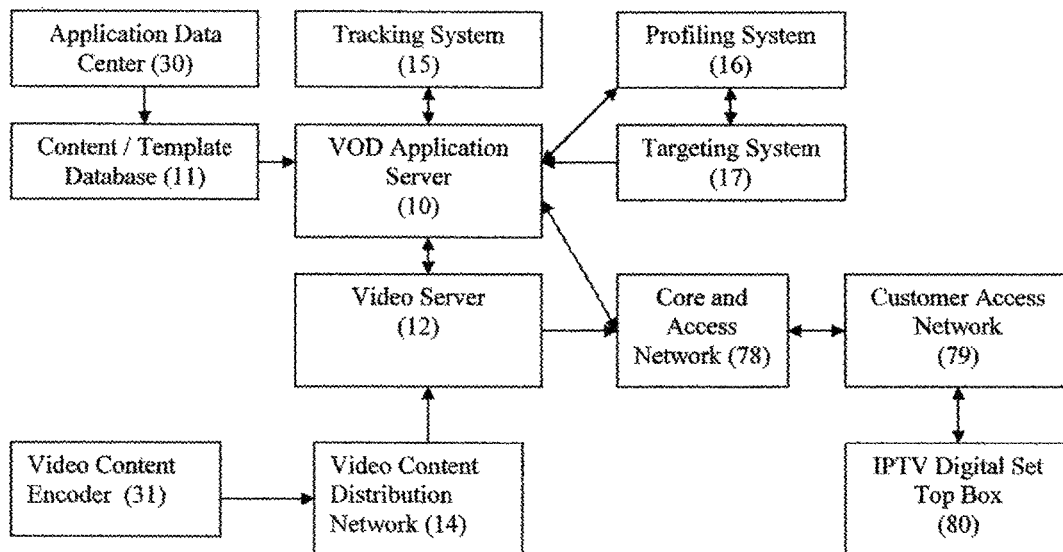
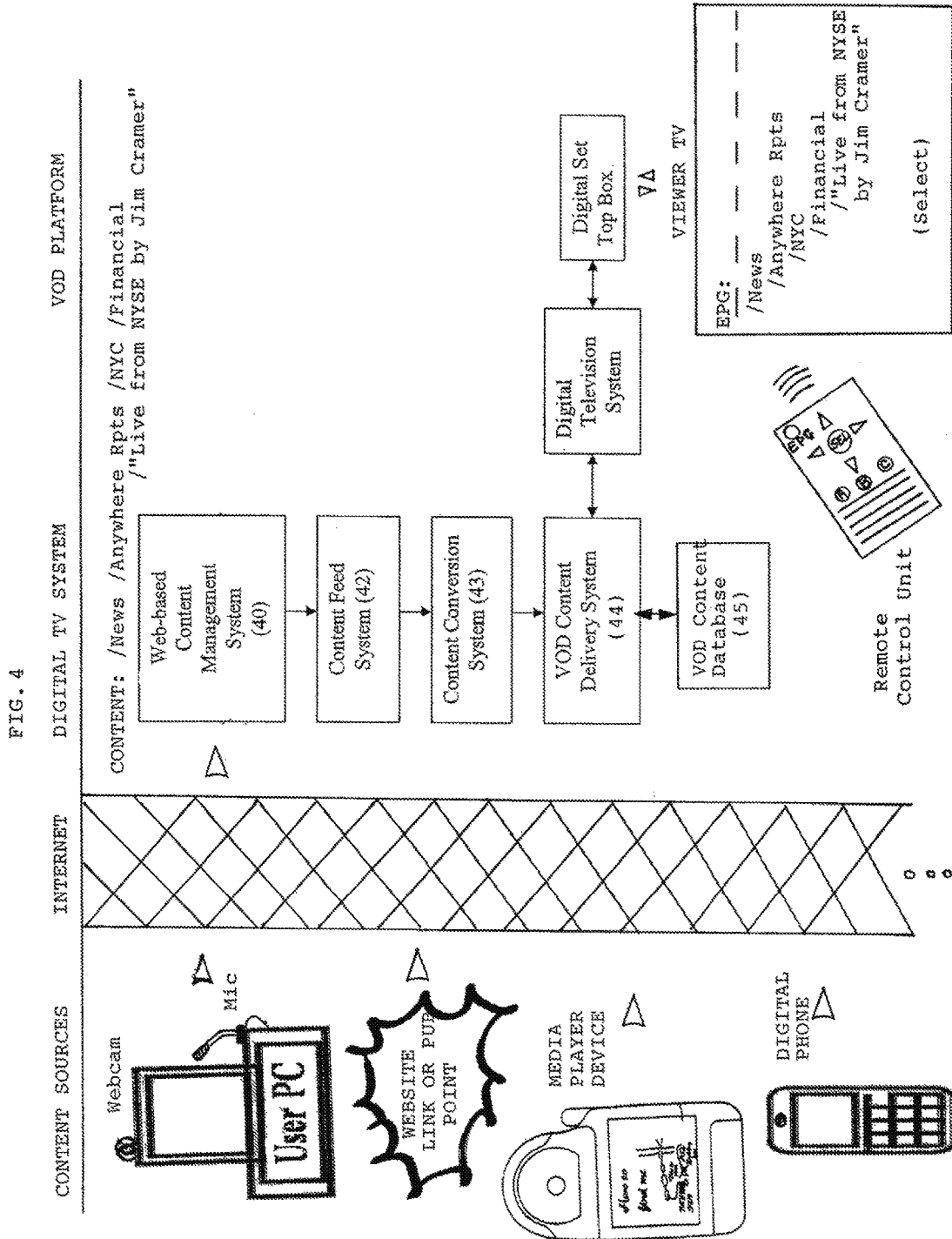
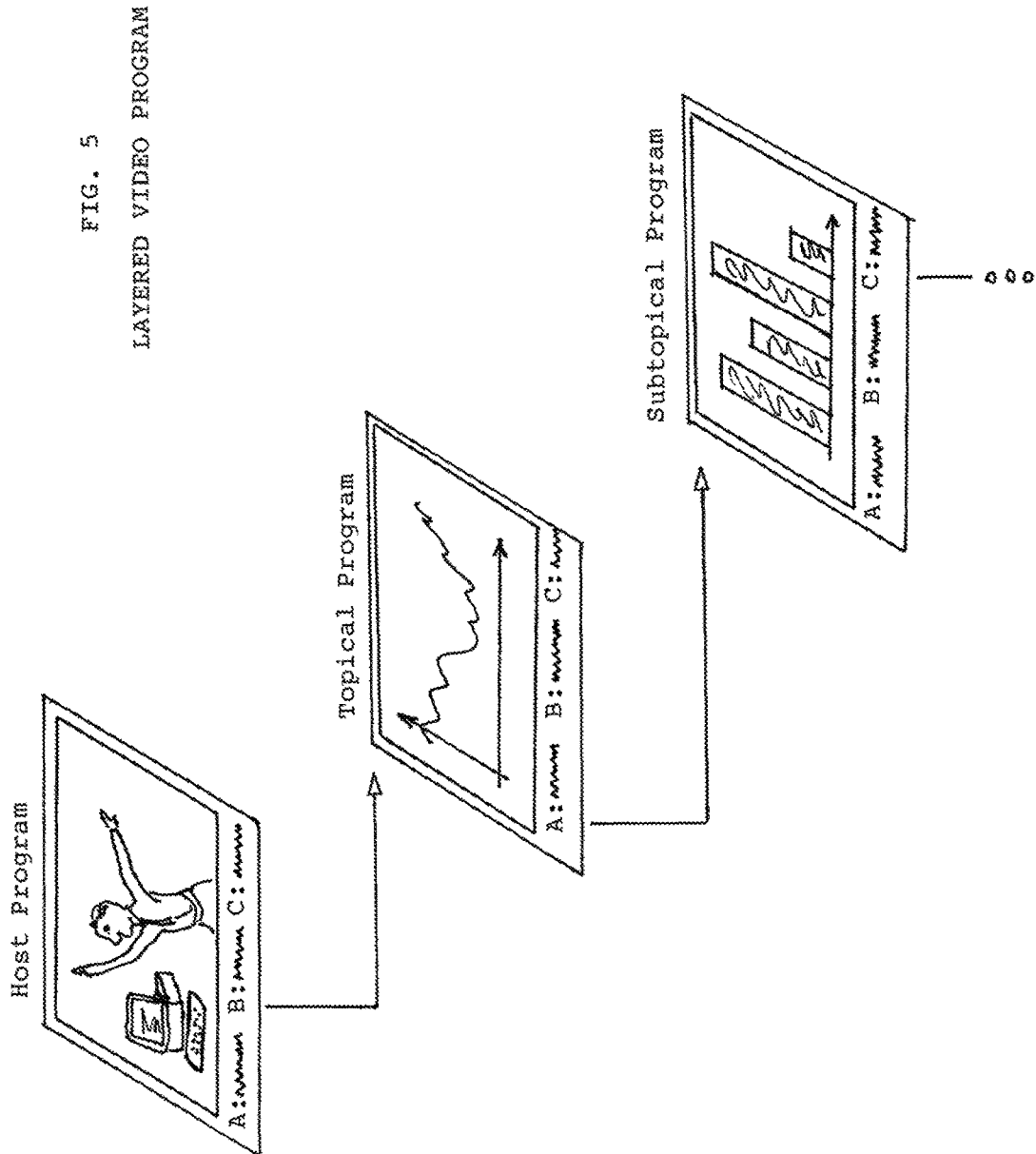


Figure 3: VOD Content Delivery System, Overall Architecture for IPTV System







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FIG. 6

601

EPG:  
/News  
/Anywhere Rpts  
/NYC  
/Financial  
--->/"Live from

FIND TITLE

PRESS KEY TO "STORE BOOKMARKS"



602

BOOKMARK USER:  
Enter PIN:

ENTER PIN NUMBER



603

BOOKMARK OPTIONS:  
A. Bookmark it now  
B. Send TV friend  
C. Related programs  
D. Biblio info

SELECT "A" TO BOOKMARK IT NOW



604

STORED BOOKMARKS:  
/News/Anywhere/NYC/...  
/Docum/PBS/Nova/...  
/Host/Cramer,Jim/...  
A: B: C: D:

LAST BOOKMARK AT TOP OF LIST  
VIEWER CAN MANAGE LIST

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FIG. 7

From Step 603, Option "B"

701

SEND TV FRIEND:

- A. Select fr Directory
- B. Select fr Contact List
- C. Select Group
- D. Send to email addr

A: 702 - Select fr Directory

Enter ltrd  
Last Name

P	E	R	E	L	L	A													
---	---	---	---	---	---	---	--	--	--	--	--	--	--	--	--	--	--	--	--

PERELLA, UserA  
PERETTI, UserA, UserB  
PEREZ, UserA, UserB,

A: Send B: Add List &amp; Send

HIGHLIGHT FRIEND NAME, USER CAN  
SEND or ADD TO LIST & SEND

B: 703 - Select fr Contact List

VIEWER CONTACT LIST:

ALGERNON, LUserA

PEREZ, MUserA, UserB

ZENO, AUserA

A: Send B: Delete C: Add to Groups

HIGHLIGHT FRIEND NAME, USER CAN  
SEND

C: 704 - Select Group

VIEWER GROUPS: 001

001: FINANCE -

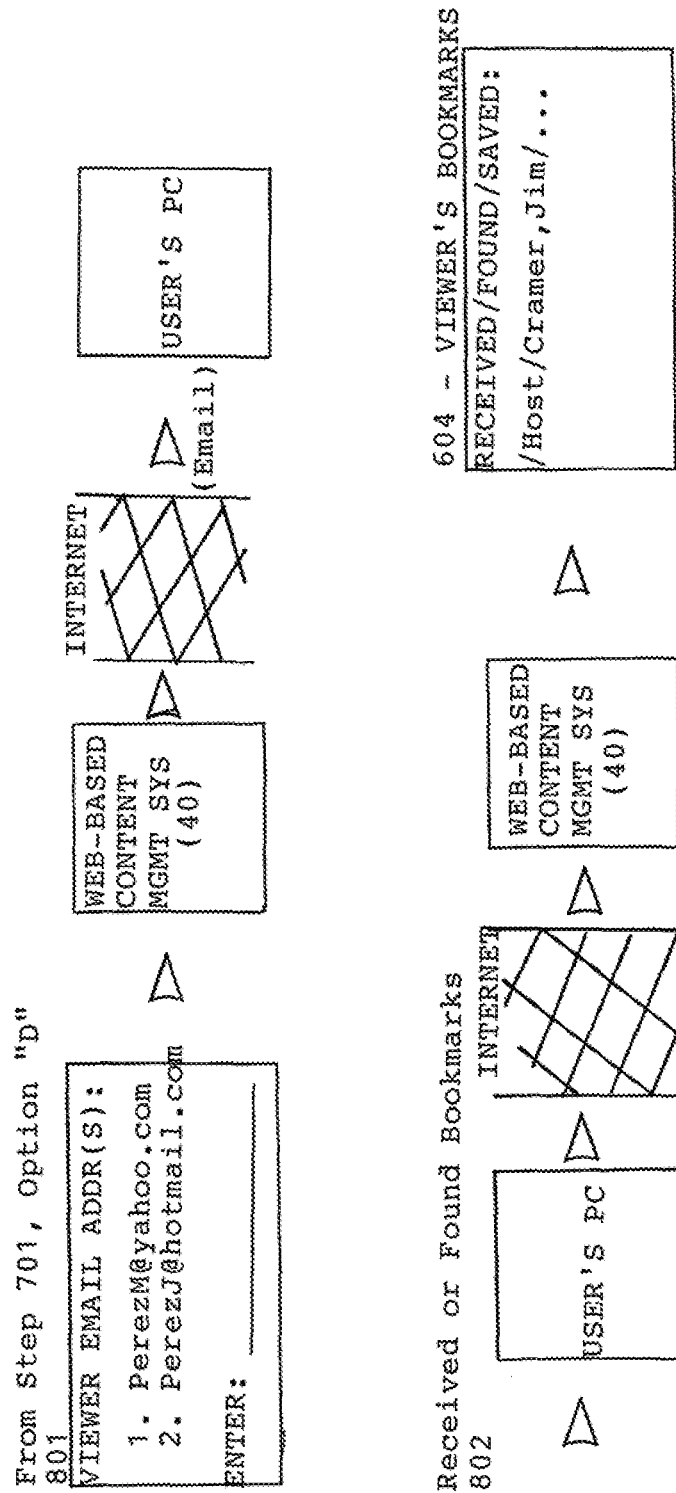
ALGERNON, LUserA  
PEREZ, MUserB

002: SCIENCE -

A: Send B: Delete

ENTER GROUP NUMBER, USER CAN  
SEND, or HIGHLIGHT USER & SEND

FIG. 8



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# SYSTEM FOR ADDRESSING ON-DEMAND TV PROGRAM CONTENT ON TV SERVICES PLATFORM OF A DIGITAL TV SERVICES PROVIDER

## CROSS-REFERENCE TO RELATED APPLICATIONS

This U.S. patent application is a continuation application and claims the benefit of copending U.S. patent application Ser. No. 14/827,090, filed on Aug. 14, 2015, of the same inventor and entitled "METHOD FOR ADDRESSING ON-DEMAND TV PROGRAM CONTENT ON TV SERVICES PLATFORM OF A DIGITAL TV SERVICES PROVIDER", which is a continuation application of U.S. patent application Ser. No. 12/632,745, filed on Dec. 7, 2009, of the same inventor and entitled "METHOD OF ADDRESSING ON-DEMAND TV PROGRAM CONTENT ON TV SERVICES PLATFORM OF A DIGITAL TV SERVICES PROVIDER", and which issued as U.S. Pat. No. 9,113,228 on Aug. 18, 2015, which was a divisional application of U.S. patent application Ser. No. 11/685,188, filed on Mar. 12, 2007, of the same inventor, entitled "METHOD FOR CONVERTING, NAVIGATING AND DISPLAYING VIDEO CONTENT UPLOADED FROM THE INTERNET TO A DIGITAL TV VIDEO-ON-DEMAND PLATFORM" and which issued as U.S. Pat. No. 7,631,336 on Dec. 8, 2009, which was a continuation-in-part application of U.S. patent application Ser. No. 10/909,192, filed on Jul. 30, 2004, of the same inventor, entitled "SYSTEM AND METHOD FOR MANAGING, CONVERTING AND DISPLAYING VIDEO CONTENT ON A VIDEO-ON-DEMAND PLATFORM, INCLUDING ADS USED FOR DRILL-DOWN NAVIGATION AND CONSUMER-GENERATED CLASSIFIED ADS", which issued as U.S. Pat. No. 7,590,997 on Sep. 15, 2009, each of which is hereby incorporated by reference as if fully set forth herein.

## TECHNICAL FIELD

This invention generally relates to the provision of video content to viewers through digital TV infrastructure, and more particularly, to converting, navigating and displaying video content uploaded from the Internet on a digital TV video-on-demand platform.

## BACKGROUND OF INVENTION

Cable television (CATV) systems are used to deliver television services to a vast majority of TV-viewing homes in the U.S. and other technologically advanced countries. The typical CATV system has a cable service provider head end equipped with video servers to transmit CATV program signals through distribution cable lines to local nodes and from there to TV subscriber homes. Within the subscriber homes, the CATV input TV line is connected to one or more customer-premises TVs which are coupled to external set-top boxes for channel tuning or are equipped with internal cable channel tuners. CATV service providers employ the spacious 1 GHz bandwidth of the typical cable (RG-6) line to carry tens of analog TV channels in the portion of the cable bandwidth allocated to analog TV signals. With digital multiplexing methods such as QAM, hundreds of digital TV signals can be carried simultaneously in the portion of the cable bandwidth allocated to digital TV signals. Cable TV service providers have also allocated portions of the cable

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bandwidth for user (return) data, broadband data connection, and voice-over-IP (VoIP) digital telephone service.

Cable TV service providers generally offer subscribers to subscribe to any of several tiers of bundled TV services on a scale with increasing rates in accordance with signal quality, TV program offerings, and types of interactive services. Digital TV services are offered through advanced digital set-top boxes that are individually addressable from the CATV head end, and also allow subscribers various interactive functions with the CATV head end via inputs to the set-top box via the remote control unit for transmission on the return data path to the CATV head end.

A recent type of interactive television service offered on digital TV systems is referred to generally as a "video-on-demand" (VOD) system, wherein a viewer can navigate through a program guide via the remote control unit and send a request via the set-top box for a desired video program to be addressed from the head-end to the subscriber's set-top box for display on the TV. Different types of VOD programs are typically bundled as a package and offered on different VOD "channels". For example, a VOD "channel" can offer on-demand movies and videos, replay sports events, infomercials, advertisements, music videos, short-subjects, and even individual TV "pages". VOD-based interactive television services generally allow a viewer to use the remote control to cursor through an on-screen menu and select from a variety of titles for stored video programs for individual viewing on demand. Advanced remote control units include button controls with VCR-like functions that enable the viewer to start, stop, pause, rewind, or replay a selected video program or segment. In the future, VOD-based interactive television services may be integrated with or delivered with other advanced interactive television services, such as webpage browsing, e-mail, television purchase ("t-commerce") transactions, and multimedia delivery.

Digital cable TV is currently the most prevalent system for offering digital TV services to home TV subscribers. However, other types of digital carriers offering broadband connections to subscriber homes have entered into competition with cable TV providers by offering digital TV services over their broadband connections. Examples of other broadband connections include DSL telephone lines, local area broadband networks, and wireless broadband networks. Digital television services offered on such broadband connections employ the TCP/IP data transport protocol and are referred to as Internet Protocol Television (IPTV). Instead of multi-casting all TV program signals into a cable line, the typical IPTV system will respond to a subscriber's request for a particular TV channel or video program by transmitting the video content individually to the subscriber's individually addressable, digital set top box at high speeds. IPTV and digital cable TV both transmit digital video in packetized data streams within closed, proprietary broadband systems; however, IPTV uses the Internet Protocol (IP) to structure, route and deliver the digital video packets within an IPTV system.

With the increasing interactive functionality and customer reach of interactive television services, advertisers and content providers are finding it increasingly attractive to employ on-demand advertising, on-demand program content, and on-demand TV transactions for home viewers. VOD content delivery platforms are being designed to seamlessly and conveniently deliver a wide range of types of advertising, video content, and transaction services on demand to home viewers. VOD content offerings are expected to increase dramatically from a few "channels" with a few score or

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hundred “titles” listed on each today to scores or hundreds of channels with thousands if not millions of titles on each in the foreseeable future. The VOD platform thus offers a gateway for greatly expanding TV viewing from a relatively small number of studio-produced program channels to a large number of new commercial publishers and ultimately a vast number of self-publishers or so-called “citizen” content publishers. It is deemed desirable to find a way for such vast numbers of content publishers to transmit their programs to the home TV, and to enable home TV viewers to find something of interest for viewing among the vast numbers of new programs.

#### SUMMARY OF THE INVENTION

In accordance with the present invention, a method for converting, navigating and displaying video content via a video-on-demand (VOD) platform of a digital TV service provider comprises:

- (a) uploading video content in a digital video format via an online network to a Web-based content management server of the VOD platform of the digital TV service provider, along with a title and a hierarchical addressing tag of hierarchically-arranged categories and subcategories for categorizing the title for the video content;
- (b) converting the content uploaded to the Web-based content management server into a standard TV digital format and storing a “local instance” thereof at a video ID (VID) address in a video content database of the VOD platform, wherein the VID address is linked to the metadata title for the video content;
- (c) listing the title of the video content in an electronic program guide of the VOD platform following the same hierarchically-arranged categories and subcategories as the hierarchical addressing tag of the video content;
- (d) providing a TV subscriber, having a TV-connected set-top box addressable by the digital TV service provider, with access to the electronic program guide for navigating through the hierarchically-arranged categories and subcategories therein in order to find the title of the video content; and
- (e) upon the subscriber selecting, via a remote control unit in communication with the set-top box, the title of the video content from the hierarchically-arranged categories and subcategories of the electronic program guide, then transmitting a return request for the selected title to the VOD platform for retrieving the video content stored at the linked VID address in the video content database of the VOD platform, and transmitting the video content to the subscriber’s set-top box for display on the subscriber’s TV.

By the method of the present invention, video content can be published for viewing on home TV with any digital TV service provider by uploading from any node or publishing site on the Internet to the provider’s Web-based content management server. The title of the program becomes automatically listed in the electronic program guide (EPG) following the same hierarchical categorization addressing indicated by the publisher of the content. Typically, the publisher will select the categories and subcategories for categorizing the title of the video content from a standard categorization hierarchy used by the digital television service provider for listing titles to be offered on its VOD platform. With this method, vast numbers of content publishers anywhere on the Internet can upload their programs

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to digital television service providers for viewing on the home TV, and home TV viewers can readily find something of interest for viewing among the vast numbers of new programs by navigating through the hierarchical addressing scheme of the provider’s EPG.

In particular, the invention method provides a convenient and substantially automatic vehicle for bringing large numbers of new blogging and pod casting-like programs to TV viewing. Such a blogging or podcasting-like program is typically presented in the video content by a “host” or “celebrity” who has been identified, or can be voted on by viewers, as a popular “Host”. The Host acts as a filter, reviewer, rater, and/or analyst to bring information of value to viewers from the plethora of content populating the viewing landscape. The Host can also serve to link the viewer to other Host programs or other VOD-listed programs, for example, by on-screen directing of the viewer to a menu of options selectable by corresponding option keys on the remote control unit. As an added feature, the EPG can be configured to enable a viewer to store bookmarks for desired VOD-listed TV programs for viewing again or with friends. The viewer’s bookmarks can also be shared with other subscribers via an on-screen Contact List maintained for each viewer, and/or shared with others online by the provider enabling transmission of the bookmark data from the VOD platform to the viewer’s email address or other online address.

The capability for Internet uploading and automatic listing in any VOD EPG opens VOD programming to a greatly expanded field of non-studio TV program publishers. The digital TV service provider can charge program placement fees that are paid by the publisher, advertiser, and/or sponsor. With future expansion of VOD “channel” capacity, the system can be opened to “citizen” publishers and paid for by program advertisers or sponsors and/or by viewer “Premium (VOD) Services” fees.

The foregoing and other objects, features and advantages of the invention are described in further detail below in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a diagram of an overall architecture for a VOD Content Delivery System in accordance with the present invention, FIG. 1B shows an example of templated Drill-Down Ad navigation, and FIG. 1C shows an example of the templated ad display model.

FIG. 2A is a process flow diagram of the overall architecture of a Classified Ad application for the VOD Content Delivery System, FIG. 2B illustrates a Content Management Website for the Classified Ad application, FIG. 2C illustrates a Content Screening Component of the system, and FIG. 2D illustrates a Content Feed and Conversion Components of the system.

FIG. 3 is a diagram of a VOD Content Delivery System adapted to Internet Protocol TV (IPTV) system.

FIG. 4 is a diagram illustrating a process flow for enabling content publishers on the Internet to upload video content to digital television service providers for viewing on the home TV.

FIG. 5 is a diagram illustrating an example of a blogging or podcasting-like program presented by a “Host” with layered topics and links to other programs.

FIG. 6 is a diagram illustrating the logic flow for using an EPG to enable a viewer to store TV bookmarks for desired VOD-listed TV programs.

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FIG. 7 is a diagram illustrating an example of sharing TV bookmarks with other TV subscribers via an on-screen Contact List maintained for the viewer.

FIG. 8 is a diagram illustrating an example of sharing TV bookmarks with others on the Internet by transmission of bookmark data to the viewer's email address.

#### DETAILED DESCRIPTION OF INVENTION

The following description describes one preferred embodiment for implementation of the invention in which the digital television service provider is one employing cable TV infrastructure. However, it is to be understood that the principles of the invention are equally applicable to other types of digital television service providers offering digital TV services over other broadband connections such as DSL telephone lines, local area broadband networks, and wireless broadband networks. Similarly, certain examples of VOD applications are described herein, e.g., advertisements that are navigated in "drill-down" fashion, and the uploading of consumer-generated classified ads to be viewed as TV classified ads. However, many other types of video content may be used in programming with this system.

Referring to FIG. 1A, an overall system architecture for a VOD content delivery system includes a VOD Application Server 10 located at a Cable Head End. The VOD Application Server 10 manages a Database 11 of templates and video content segments from Video Server 12 for generating templated VOD content. The VOD content is generated in response to a viewer request signal transmitted from the Digital Set Top Box 21 of a viewer's TV equipment through the Digital Cable Television System 13 to the VOD Application Server 10 at the Cable Head End. The VOD Application Server 10 may be of the type which enables any compatibly-developed VOD applications to be loaded on and operated on the server. An example of such a VOD Application Server is the Navic N-Band™ server, offered by Navic Systems, Inc., d/b/a Navic Networks, of Needham, Mass. This is an integrated system which provides an application development platform for third party application developers to develop new VOD service applications, viewer interfaces, and ancillary interactive services for deployment on VOD channels of CATV operators in cable service areas throughout the U.S. A detailed description of the Navic N-Band system is contained in U.S. Patent Application 2002/066,106, filed on May 30, 2002, which is incorporated herein by reference.

Templates for displaying VOD content are created at an Application Data Center 30 and stored in the Database 11 for use by the operative VOD application. The templates may be designed, for example, to present video ad content displays in a logo frame, or to provide navigation buttons and viewer selection options in a frame around currently displayed video content. In the preferred embodiment described in greater detail below, the templates are used to provide navigation aids in a series of progressively more focused ad display types. A Video Content Encoder 31 is used to encode raw video feeds into formatted video content segments compatible with the VOD platform and supply them through a Video Content Distribution Network 14 to the Video Server 12.

In operation, the VOD Application Server 10 operates a VOD application for the CATV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key

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press on the viewer's remote control unit transmitting an IR signal to the Set Top Box 21 that is sent on a back channel of the Digital Cable Television System 13 to the VOD Application Server 10 at the Cable Head End. In response to the signal, the VOD Application Server 10 determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database 11 and video content segment from the Video Server 12, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server 10 retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a "drill down navigation" method to find specific end content of interest.

Referring to FIG. 1B, a preferred embodiment of the templated VOD content delivery system is shown providing a User Interface using Drill-Down Navigation through display ads, such as for automobile infomercials. When the viewer selects a VOD application (channel), such as "Wheels-On-Demand", the viewer's TV displays a Main Menu with buttons inviting the viewer to "Select Category". The viewer can select an "Auto" category, and the TV then displays an "Auto" menu with buttons inviting the viewer to "Select Make", such as Make A, Make B, etc. When the viewer makes a selection, such as Make A, the viewer's TV displays a further menu that is a Gateway into templated VOD content delivery which enables Drill-Down Navigation by templated display ads. Through the Gateway, the VOD Application leaves the Menu mode and enters the Drill Down Navigation mode for successively displays of hierarchically-ordered video content which allow the viewer to navigate to progressively more focused content. In this example, the highest level of the hierarchy includes categories for Model, Local Dealer, Sales Events, and/or Inventory. When the viewer selects a category such as "Model" from the Gateway, for example, the VOD Application creates a templated ad display showing video content generic to all models by that automaker framed in a frame which has links (buttons or choices) for a list of the specific models made by that automaker. When the viewer selects the link to a specific model, "Model A" for example, the VOD Application creates a templated ad display showing video content for Model A, and the viewer can then choose to run a long-form infomercial of the Model A video. Alternatively, the Drill-Down Navigation can continue with further levels of specificity, such as "Custom Packages", "Options", "Colors/Stylings", etc. Similarly, the selection of the "Local Dealer" category from the Gateway can bring up a templated ad for local dealers with links to specific local dealers in the viewer's cable service area, and a click on a specific "Dealer A" can bring up a templated ad for Dealer A with further links to more specific content pertaining to Dealer A, such as "Current Sales Promotions", etc.

In this manner, the templated VOD content delivery system allows the viewer to navigate to specific content of high interest to the viewer using the Drill-Down ads as a navigation tool, while at the same time having a unique visual experience of moving through a series of ads mirroring the viewer's path to the subject of interest. The templated VOD ads are generated dynamically by searching the Content/Template database with each request by a viewer,



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enabling the system to display updated navigation choices and content simply by updating the database with updated links and video content. For example, if the Auto Maker changes the Model types of autos currently available, or if Local Dealer A changes its current sales promotions for autos currently available, that advertiser's ads can be updated with new, template frame navigation links and content, instead of entirely new ads or screen displays having to be shot, produced, contracted, delivered, and programmed with the cable TV company. Many other types of layered or in depth ads, subjects, and interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down Navigation designs.

In FIG. 1C, an example illustrates how a templated VOD display is generated in layers. A Background screen provides a basic color, logo, or graphical theme to the display. A selected Template (display frame) appropriate to the navigation level the intended display resides on is layered on the Background. The Template typically has a frame in which defined areas are reserved for text, display image(s), and navigation links (buttons). Finally, the desired content constituted by associated Text, Image & Buttons is retrieved from the database and layered on the Template. The resulting screen display shows the combined background logo or theme, navigation frame, and text, video images, and buttons.

Referring again to FIG. 1A, a Tracking System 15 of conventional type can be installed at the Cable Head End to aggregate non-personal data on what channels and programs viewers watch. For the Drill Down Navigation method, the Tracking System 15 can include tracking of the navigation paths viewers use to find subjects of interest in a VOD Application. The aggregation of viewer navigation data can indicate what subjects are most popular, whether some subjects are of greater interest to viewers at certain times of day, of certain demographics, or in relation to certain products or services. The VOD Application Server 10 can export the aggregated viewer navigation data to an external Profiling System 16, such as a non-biased or unrelated firm applying profile analysis methods. The results of the Profiling System 16 can be communicated to a Targeting System 17, such as a template design firm or content production company, to fine-tune the presentation of the templated VOD content consistent with viewer preferences or interests. The feedback from the Targeting System can be supplied as feedback to the VOD Application Server to modify the Content/Template Database 11.

Another application for the templated VOD content delivery system can be developed to support video advertisements which link national to local market ad campaigns in "drill-down" fashion. Advertisers, both national and local, can pay for placement of their video advertisements on the system. When the VOD Application is run, the national ads are displayed as a Gateway to linking to the local market ads. In this manner, national ads can be used to transition viewers from general interest in a product to finding specific information about the product available locally.

The templated VOD content delivery system can also support "traffic building" videos, including music videos, that may not generate direct revenue. Once a video is encoded and registered into the system, the management and distribution of the video is conducted through software systems and automated controls. The User Interface pro-

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vides the user with the ability to navigate and find desired video content. Selection of a category presents the user with a list of video titles available for playback. Categories and title lists can be generated using real-time database queries, allowing for database-driven management of content within the User Interface. The User Interface can also support a search interface which allows the user to search the video content database to generate a list of video titles with specific characteristics.

As another aspect of the present invention, a VOD content delivery system may be adapted to offer consumer-generated classified ads on TV. The VOD content delivery system is provided with a Content Management frontend to receive consumer input and convert it to video display ads maintained in the system database. Referring to FIG. 2A, a system for managing, converting and displaying individual consumer-generated ads on a VOD content delivery system has a Web-based Content Management System 40 for enabling an individual user to upload content from their computer via a web browser to display a consumer-generated video ad on TV. The uploaded content includes meta data for classifying the video ad by title and topical area(s). A Content Screening System 41 is used for screening the content input by the individual user, such as by performing automatic searching for objectionable text, audio, video and/or images and rejecting the content if found objectionable.

A Content Feed System 42 is used to automatically transfer consumer-generated content screened through the Content Screening System 41 to a Content Conversion System 43. This system automatically converts the consumer-generated content supplied by the Content Feed System 42 into video display format compatible with the VOD content delivery system. The converted video ad is indexed by title and classified topical areas according to the meta data supplied by the user, in accordance with the indexing system maintained by the Content Management System. The VOD Content Delivery System 44 operates a Classified Ads VOD Application in which menus for finding classified ads are navigated by viewers, and specific classified ads are delivered through the Digital Cable Television System for display as video ads on the viewer's TV equipment in response to viewer request input by remote control to the Digital Set Top Box 21, as described previously with respect to the operation of the general VOD platform.

Referring to FIG. 2B, the Web-based Content Management System 40 includes a plurality of functional components to allow consumers to create and manage their own classified ads as interactive television content, as well as pay for the distribution of their content within the digital cable television system. A Classified Management Application 50 is used to receive consumer input content, have it screened (by the Content Screening System 41, not shown), and store it in the Classified Metadata, Image and Video Database 51. Consumer payment for running video ads is handled by the Transaction Processing Component 53. Also included in the Content Management System is an Account Management Component 55 and Account & Permissions Database 56 for management of user accounts for use of the web-based TV Classified Ads system. A Bulletin Board Ads application may be operated in parallel with the TV Classified Ads application. A Bulletin Board Management Application 54 and Database 57 enable the creation and management of consumer-generated content relating to public announcements and other items of general interest for groups, organizations or topics. The preferred VOD Content Delivery System uses templated VOD content, and a Template

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Library 58 is used to store templates for both the Classified Ads and Bulletin Board Ads applications.

The Account Management Component controls the access by persons to the web-based Content Management System. The Account Management Component identifies persons accessing the system for the first time and allows these persons to register and create an account by providing an account name, password, credit card information and other information required for the payment of fees. The Account Management Component controls the access by registered users to their accounts and manages the privileges and security associated to all accounts. Persons may create accounts for the creation and management of Classified Ads. Accounts capable of accessing the Bulletin Board Management Application may also be assigned by a system administrator in the Account Management Component. Any account capable of accessing the Bulletin Board application can then create and manage bulletin board ads for the assigned bulletin boards.

The Classified Content Management System enables users to upload text, audio, video, and/or image files for classified ads in industry-standard file formats and have it converted into video display ads compatible with the VOD Content Delivery System. Classified ads are searched on the viewer's TV equipment by menus and lists indexed by title and topical areas corresponding to the metadata associated with the classified ads content. Selection of a listed item results in the display of a TV display ad containing uploaded text, images, video and/or audio. Users pay listing fees to the operator of the system for maintaining and displaying the classified ads on the digital cable television system.

Significant features of the Classified Ads Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) uploading digital images of the item to the Content Management System; (c) uploading digital video of the item to the Content Management System; (d) uploading digital audio regarding the item to the Content Management System; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided content; (j) ability to save classified content in persistent memory or storage for subsequent modification; (k) ability to mark classified content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when a classified content item is to become accessible by users of the interactive television system and the data and time when a classified content item is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that a specific content item is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created classified content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific consumer-generated content by users of the interactive television system; and (p) ability to calculate fees for classified content and submit payment of the fees using the Transaction Processing system.

As noted in (i) above, the Classified Content Management System allows the user to view the content they have

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composed using the templates. The templates are designed specifically for use on interactive television systems and the user is able to view on the web-interface their content as composed for presentation on television. As noted in (j) above, the Classified Content Management System allows the persistent storage of classified content; although the user is composing interactive television pages using a template system, the content is persistently stored as individual elements to simplify changes by the user and to allow the conversion of the content to different formats as required by different interactive television systems.

The Bulletin Board Content Management System provides the users of the web-based Content Management System with content creation and content management tools for the creation and maintenance of consumer-generated content related to announcements and other informational items of general interest. Bulletin Board content is displayed on the interactive television system as dedicated interactive television screens (bulletin boards), where approved groups, organizations or topics are each assigned a bulletin board for the display of their information. Bulletin Board content is displayed as list items organized within a bulletin board; selection of a list item results in the display of an interactive television screen containing or providing access to the descriptive data, text, images, video and audio regarding the item.

An alternative implementation of a Bulletin Board can display the content as scrolling text, where the user scrolls through the text, or the text scrolls automatically. Bulletin Board accounts will pay fees determined by the operator of the system for the distribution of the bulletin board content on the interactive television system for display on the digital cable television system. Significant features of the Bulletin Board Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) upload digital images to the content management; (c) upload digital video to the content management system; (d) upload digital audio to the content management system; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided bulletin board content; (j) ability to save bulletin board content in persistent memory or storage for subsequent modification; (k) ability to mark bulletin board content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when specific bulletin board content is to become accessible by users of the interactive television system and the data and time when specific bulletin board content is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that specific bulletin board content is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created bulletin board content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific bulletin board content by users of the interactive television system; and (p) ability to calculate fees for bulletin board content and submit payment of the fees in conjunction with the Transaction Processing component.

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The Transaction Processing component allows users of the Classified Content Management System and Bulletin Board Content Management System to determine and pay for any fees resulting from their use of these systems. The Transaction Processing component will allow users to pay for fees using credit cards or other supported payment methods. Significant features of the Transaction Processing component include: (a) ability to maintain business rules for use by the Transaction Processing system to determine fees based on user type and content type; (b) ability to maintain business rules for one or more payment methods for use by the Transaction Processing system in handling the settlement of fees; (c) ability to maintain business rules for user account and payment settlement conditions such as delinquency and lack-of-credit for use by the Transaction Processing system in determining user account privileges and content status; and, (d) ability to process payment of fees in real-time for payment methods that support real-time settlement.

Referring to FIG. 2C, the Content Screening System (41) is comprised of a Text Screening Application 60 which searches for objectionable words or phrases, an Image Screening Application 61 which searches for objectionable graphic images, a Video Screening Application 62 which searches for objectionable images or audio words or phrases in video segments, and an Audio Screening Application 63 which searches for objectionable words or phrases in audio segments. The Content Screening System can be used for both Classified Ads content and Bulletin Board content. Content that has been screened by the Content Screening System is then transferred to the aforementioned Classified Ads Database 51 or the Bulletin Board Content Database 57. The system also has component 64 for Editorial and Customer Service Functions for Classified Ads, and component 65 similarly for Bulletin Board content. These can each include an Email Function to send confirmations of input, reasons for rejection of posting, suggested corrections, further processing, and posting of content to consumers using the system.

Significant features of the Content Screening System include: (a) ability to maintain a library of objectionable or illegal words and phrases for use in the screening of text; (b) ability to perform automated analysis of user content text using the text library as an input and alert system administration personnel to the use of objectionable or illegal content and the use of unknown and suspect words or phrases; (c) ability to maintain a library of objectionable or illegal image elements for use in the screening of images; (d) ability to perform automated image recognition analysis against user content images using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (e) ability to maintain a library of objectionable or illegal image elements for use in the screening of video; (f) ability to perform automated image recognition analysis against user content video using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (g) ability to maintain a library of objectionable or illegal audio elements for use in the screening of audio; (h) ability to perform automated audio analysis against user content audio using the library of audio elements as an input and alert system administration personnel to the use of objectionable or illegal content; and (i) ability to save screened content in persistent memory or storage for subsequent processing. Content Screening is automatically performed with the Content Management System 40 during the user process of submitting and/or creating

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consumer-generated content or may be performed as a process subsequent to the creation of content by the user.

Referring to FIG. 2D, the Content Feed System 42 and the Content Conversion System 43 provide for the transfer of user content from the Content Screening System and conversion to video content format compatible with the VOD Content Delivery System 44. The Content Feed System 42 has a Content Selection/Date Filtering Application which selects consumer-generated content uploaded to the system that is within the dates contracted for posting and display of the content as Classified Ads or on Bulletin Boards. Content within the active date range is transferred to the Active Classified Ads Database 71A or the Active Bulletin Board Database 71B.

The Content Conversion System receives consumer-generated content in industry-standard formats or created in viewable format (HTML) on the web-based input system and converts the content into formats compatible with the VOD Content Delivery System and for display on viewers' televisions. The Content Conversion System 43 has an Image Conversion Application 72 which converts consumer-uploaded image files (in industry-standard formats such as JPEG, GIF, TIFF, BMP, PDF, PPT, etc.) into VOD content format, a Video Conversion Application 73 which converts consumer-uploaded video files into VOD content format, and an Audio Conversion Application 74 which converts consumer-uploaded audio files into VOD content format. Content converted to VOD content format is stored in the Active Converted Classified Ads Database 75A or the Active Converted Bulletin Board Database 75B. The content is subject to a further Production Push Function 76A, 76B and stored in the Production Classified Ads Database 77A or the Production Bulletin Board Database 77B, if any presentation formatting, date stamping, template framing, or other system editing is required by the system.

Significant features of the Content Feed System include: (a) ability to select user content for submission to the Content Conversion System through the testing of appropriate parameters including the date and time information contained in the user content; (b) ability to appropriately package the elements of the user content to permit the efficient transfer of these content elements to the Content Conversion System through an Application Program Interface or other interface; (c) ability to create, maintain and execute a schedule for when the Content Feed System will execute on an automatic basis for the automatic transfer of consumer-generated content to the Content Conversion System; and, (d) ability to execute the functions of the Content Feed System on a manual basis in the presence or absence of a schedule. The Content Feed System may be able to package and distribute content to single or multiple Content Conversion Systems.

Significant features of the Content Conversion system include: (a) ability to receive content packages delivered by the Content Feed System through an Application Program Interface or other interface; (b) ability to process the elements of consumer-generated content into data, text, graphic, video and audio elements that are compatible with the interactive television system and maintain the content presentation created by the user on the web-based Content Management System; (c) ability to save reformatted content in persistent memory or storage for subsequent distribution and use by the interactive television system; and, (d) ability to inform the interactive television system that consumer-generated content is available for distribution and use. The Content Conversion System may be added as a component system of the VOD Content Delivery System, or it may be

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implemented as a wholly separate system that connects to the VOD Content Delivery System through an Application Program Interface or other interface. When implemented as a system that is separate from the VOD Content Delivery System, it is possible to support multiple, different interactive television systems by either (a) incorporating multiple formatting requirements into a single instance of the Content Conversion System or (b) creating multiple Content Conversion Systems, each supporting the formatting requirements for a specific interactive television system. Either implementation allows for a single instance of consumer-generated content that is created and maintained using the web-based Content Management System to be distributed and displayed on multiple, different interactive television systems with different formatting requirements.

The VOD Content Delivery System **44**, as described previously, provides for the distribution of screened, converted, properly formatted consumer-generated content to viewers' televisions, typically through the use of digital set-top boxes connected to a digital cable television system capable of supporting real-time two-way data transfer between the set-top box and the Cable Head End. Significant features of the VOD Content Delivery System include: (a) ability to receive properly formatted content from the Content Conversion System; (b) ability to distribute said content over a digital cable television system and display this content on television as an interactive television presentation; (c) ability to receive user commands generated by an infrared remote control device, keyboard or other device; (d) ability to respond to the user commands by displaying appropriate content or executing desired functionality; and, (e) ability to generate and collect data regarding the user sessions and the viewing data regarding consumer-generated content on the interactive television system and make this data accessible to the Tracking System. The VOD Content Delivery System can employ templated VOD content delivery, as described previously with respect to FIG. 1A, enabling use of the Drill Down Navigation method in which viewers can navigate visually through classified ad hierarchical categories to specific titles or content.

The VOD Content Delivery System for the Classified Ads application can also employ the Tracking System **15** for the collection and consolidation of viewing data generated by the interactive television system and the generation of reports against this viewing data. For example, the Tracking System can track the number of viewer requests for viewing that a classified ad received in a given period and calculate billing charges accordingly. The Tracking System can make this information available to users of the Content Management System as well as to system administrative personnel performing general analysis of interactive television services and associated content. Significant features of the Tracking System include: (a) ability to access and process the data generated by the Classified Ads application; (b) ability to form summaries of the viewing data against desired parameters; (c) ability to save data, summaries and reports in persistent memory or storage for subsequent modification or access; (d) ability to make data, summaries and reports accessible by users of the web-based Content Management System, restricting the data accessible by any specific user to data regarding the content created by that user account on the Content Management System; and, (e) ability to make data, summaries and reports accessible by to system administration personnel.

As another aspect of the present invention, implementation of a VOD content delivery system can be made on any digital television system that supports real-time two-way

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data transfer and interactivity between the digital Set Top Box and application servers and VOD servers located at headends or other service points within the television system network. An alternative digital television system of increasing importance in the marketplace is Internet Protocol Television (IPTV). IPTV is a system for delivering video content, both broadcast and Video on Demand, to digital set top boxes and other devices. IPTV and digital cable both transmit digital video in packetized data streams within closed, proprietary broadband systems; however, IPTV uses Internet Protocol (IP) to structure, route and deliver the digital video packets within an IPTV system.

Referring to FIG. 3, an alternative implementation for a VOD content delivery system is illustrated for an IPTV system. The components of the VOD content delivery system listed in the figure are similar to those in FIG. 1A. However, FIG. 3 illustrates the terminology and network architecture of an IPTV system as used for the purposes of this invention. The VOD Application Server **10**, Content I Template Database **11**, Video Server **12** and Tracking System **15** are located in the IPTV Service Node; the IPTV Service Node is equivalent to the Cable Headend in FIG. 1A. Systems external to the IPTV Service Node such as the Application Data Center **30**, Profiling System **16**, Targeting System **17** and Video Content Distribution Network **14** connect to their associated VOD Content Delivery System components housed within the IPTV Service Node in manners similar to those used in a digital cable system implementation. IPTV systems can use multiple network technologies within their closed, proprietary broadband network. Core and Access Network **78** are high-bandwidth networks connecting IPTV Service Nodes in order to support the central transport of video streams. The Core and Access Network **78** feed the Customer Access Network **79**, which supports the physical network connection into the customer premise and connects to the IPTV Digital Set Top Box **80**. The combination of the Core and Access Network **78** and Customer Access Network **79** is the functional equivalent of the Digital Cable Television System **13** in FIG. 1A.

In operation, the VOD Content Delivery System implementation for IPTV is identical to the digital cable implementation. The VOD Application Server **10** operates a VOD application for the IPTV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer's remote control unit transmitting an IR signal to the IPTV Digital Set Top Box **80** that is sent on as IP-encapsulated message through the IPTV System to the VOD Application Server **10** at the IPTV Service Node. In response to the signal, the VOD Application Server **10** determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database **11** and video content segment from the Video Server **12**, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server **10** retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer

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can use the series of linked templated VOD displays as a “drill-down navigation” method to find specific end content of interest.

Similarly, all previously mentioned adaptations of the VOD Content Delivery System implementation for digital cable, such as Classified Ads and Bulletin Boards, are supported identically on IPTV implementations.

Wide Ranging Content Uploadable Via Internet to Digital TV VOD Platform

In the foregoing description, the uploading, management, conversion, and display of content uploaded from the Internet for viewing on a VOD platform was described for an embodiment in which consumer-generated classified ads and other TV-displayable information of interest are uploaded via Internet for conversion and display as video programs on cable TV infrastructure. Even further, the principles of the invention are applicable to a wide range of other content uploadable on the Internet and to other types of digital television service providers such as DSL telephone lines, local area broadband networks, and wireless broadband networks. In the following description, another exemplary embodiment of the present invention is described with respect to uploading wide ranging content via Internet for viewing on the VOD platforms of any type of digital TV system.

Referring to FIG. 4, informational/media content from any Content Source can be uploaded via Internet to a Digital TV System for placement on its Video-on-Demand (VOD) Platform to be viewable as TV programs on Viewers’ TVs by selection from an Electronic Program Guide (EPG) transmitted via the viewer’s Set Top Box for display on the TV. Content is uploaded by an author or publisher to the Web-based Content Management System 40, which processes the content through a Content Feed System 42 and Content Conversion System 43 (from standard digital data formats to TV video format) to the VOD Content Delivery System 44 where it is stored in its associated Video Content Database 45 for retrieval upon viewer request. Uploaded TV programs are offered to viewers by listing them on the EPG, and upon viewer selection via the Set Top Box, are delivered via the Digital TV System infrastructure.

For VOD platforms, an EPG is typically presented to viewers as a program guide displayed on the TV for finding a title of interest associated with that particular VOD channel. The EPG display typically starts with a top level menu offering broad categories of content, e.g., Movies, Documentaries, TV Shows, News, Sports, Community Events, Self-Help, Infomercials, etc. The viewer can cursor through the categories and select a category by moving the cursor to a desired category title, such as “News”, and clicking the “Select” key on the remote control unit. The EPG then brings up the next display of subcategories available in the selected category. For the “News” category, it might display subcategories of “ABC”, “NBC”, “CBS”, “CNN”, “MSNBC”, “Anywhere Reports”, etc. Upon selecting “Anywhere Reports”, the EPG would then display the next level of subcategories down, e.g., “San Francisco”, “Los Angeles”, “Denver”, “Dallas”, “Chicago”, “Boston”, “New York”, “D.C.”, etc. This sequence continues until the viewer selects a program title or exits the EPG.

The EPGs for VOD “channels” thus use program guide displays on the TV which are in a structured hierarchy to allow the viewer to navigate to a program title of interest. Upon selecting the title, a data return associated with that title is sent from the set-top box as a request to the VOD platform for the program associated with that title. The EPG database of the VOD platform maintains an index linking the

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program titles to the addresses in the VOD Content Database 45 where the respective programs are stored. Upon receiving a request of a program title from the set-top box, the VOD Content Delivery System 40 retrieves the corresponding video content from the Database and transmits it on its broadband network to the set-top box that sent the request. Advanced VOD platforms also have VCR or DVR-like functions that enable a viewer to Pause, Play, Rewind, Fast Forward, and Stop a program using the TV remote control unit.

As more and more video content is offered on VOD platforms of digital TV systems, it may be desirable to dynamically adjust the EPG displays of categories, subcategories, and titles for each viewer so as to minimize the number of remote control keypresses needed to navigate to a program title of interest. Such a system is disclosed in a concurrent continuation-in-part U.S. patent application by the same inventor, entitled “Dynamic Adjustment of Electronic Program Guide Displays Based on Viewer Preferences for Minimizing Navigation in VOD Program Selection”, which is incorporated herein by reference.

In the present invention, the EPG hierarchical display structure used in VOD platforms is used as a form of “hierarchical addressing” that uniquely allows viewer navigation to and identifies a program title of interest. This EPG hierarchical addressing scheme can be represented as a string of category term, subcategory term(s), and title that together (as a string delimited by standard character delimiters) uniquely identifying each program offered on the EPG channel. In FIG. 4, for example, the EPG address for a program title on the VOD channel might be represented with a TV (EPG) address as:

TV:/News/Anywhere Reporting/New York/Financial/“Live from NYSE by Jim Cramer”

The uploaded content may be of any digital media type and come from any web-based source. For the TV viewing environment, content accompanied by video images and voice and/or sound is preferred for presentation as entertainment or recreational viewing. Such content can be generated ubiquitously from any PC computer by an author or publisher using a video or webcam for images and a microphone for audio. The media streams may be edited and composed with a multimedia program, such as Microsoft Windows™ Media, Apple Quicktime™, Macromedia Flash™, and others. Similarly, the content may already be composed as a video program and posted on a website as a downloadable video program via a web link or other URL address. For example, websites like YouTube.com, Brightcove.com, and others have become very popular by offering thousands of self-published video programs by nonprofessional authors and publishers for viewing on the Internet. Such video content may also be uploaded from digital media devices such as iPod™ Video sold by Apple Computer Corp. on which it has already been downloaded from a website. It may also be uploaded from digital phone devices such as iPhone™ sold by Apple which has an on-board camera for video and microphone for sound.

The term “Internet” is intended to include any wide area digital network or network of networks connecting a universe of users via a common or industry-standard (TCP/IP) protocol. Users having a connection to the Internet commonly connect browsers on their computing terminal or device to web sites that provide informational content via web servers. The Internet can also be connected to other networks using different data handling protocols through a gateway or system interface, such as wireless gateways using the industry-standard Wireless Application Protocol

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(WAP) to connect Internet websites to wireless data networks. Wireless data networks are being deployed worldwide and allow users anywhere to connect to the Internet via wireless data devices.

The Digital TV System in FIG. 4 can be of any type that supports video-on-demand programming to TV viewers on any suitable type of VOD platform (infrastructure). While it may be a Cable TV system as described previously, it may be any type of digital TV system providing TV services via a high-speed data connection to the viewer's TV. For example, it may be an Internet Protocol TV (IPTV) system of the type connected to home subscribers via phone DSL lines, cable or other high-speed, high-bitrate connections. As previously described with respect to FIG. 3, the IPTV system can support video-on-demand TV services to TV viewers on a scale that cannot be supported by Internet video websites. The Internet is not an infinitely scalable resource, and placing a burden such as high-bitrate, high definition, full-screen video streams in any significant volume can overwhelm the Internet in its present form. IPTV transmits video programs in digital format using the IP protocol, but instead of transmitting over common Internet connections, it transmits over high-speed, high-bitrate connections that are envisioned to be implemented ultimately as all-fiber optical "last mile" connection to the home.

In the present invention, content can be uploaded (manually or by automatic feed) via the Internet to the Web-based Content Management System 40 of a Digital TV System and automatically converted, navigated and selected/displayed on the VOD platform for viewing on home TV. Automatic navigation, selection and display is enabled by adopting the same EPG hierarchical addressing scheme used for the VOD program guide as the addressing metadata identifying content uploaded on the Internet. When an author or publisher connects to the Web-based Content Management System 40, the author or publisher selects the category term, subcategory term(s) and title by which it is desired to find the program title in the TV EPG display hierarchy. Thus, when the above-mentioned example of a video program is uploaded, the hierarchical address for that program would be selected as:

TV:/News/Anywhere Reporting/New York/Financial/"Live from NYSE by Jim Cramer".

This hierarchical addressing metadata is associated with or tagged to the content when uploaded to the Web-based Content Management System 40, and is carried over into the VOD/EPG navigation scheme displayed on the TV. By carrying over the hierarchical address metadata into EPG navigation, the invention allows the content to be automatically listed in the EPG under the common addressing scheme to enable viewers to find any program of interest. The hierarchical addressing string of terms resembles URL addressing commonly used on the Internet. Thus, Internet users can readily become familiar with finding TV programs on the VOD EPG guide due to its resemblance to finding web resources with a URL. Indeed, in the convergence of Internet and TV worlds, a TV EPG hierarchical address may be thought of as a URL for a TV program.

The uploaded content is converted, as previously described, into a standard TV digital format, and a "local instance" thereof is stored at an assigned VID address in the Video Content Database 45 of the VOD platform. The VID address is linked to the metadata title for the video content listed in the EPG. The hierarchical address for the title is automatically carried over into the EPG navigation scheme, and can be found by a viewer cursoring (with the TV remote control) through the EPG following the same hierarchical

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addressing sequence. Upon the subscriber selecting, via a remote control unit in communication with the set-top box, the title of the video content from the hierarchically-arranged categories and subcategories in the EPG, a return request for the selected title is transmitted to the VOD platform for retrieving the video content at the linked VID address in the Video Content Database. The requested video program is then retrieved and transmitted by the VOD Content Delivery System 44 through the digital TV lines to the subscriber's set-top box for display on the subscriber's TV.

By the method of the present invention, the title and hierarchical address assigned by the publisher of the program is automatically carried over into the TV electronic program guide (EPG) following the same hierarchical addressing indicated by the publisher of the content. The publisher selects categories and subcategories for categorizing the title of the video content from the EPG categorization scheme presented by the digital television service provider for the listing of titles on one of its VOD channels. With this method, vast numbers of content publishers anywhere on the Internet can upload their programs with a minimum of conversion and handling steps by the digital television service provider. Home TV viewers can then easily use the EPG hierarchical navigation scheme to find something of interest for viewing.

Digital TV service providers can thus greatly expand the content viewable on the VOD platform from studio-generated programs and canned advertisements to an infinite universe of authors and publishers connected to upload viewable content to their system via the Internet. For example, local content can be created and published by people in a service area's local community—its independent filmmakers, its college students and professors, its civic leaders and others—to provide programming for TV. Providing a vehicle for "citizen content" or "citizen journalism" to be seen on TV is expected to tap into the boundless resourcefulness and creativity of the TV audience itself and enable nonprofessionals to become part of the TV content-creating process. Such citizen content creators and journalists can create content that would otherwise not rise to the level of interest for studios to create programs for them or be overlooked by larger media outlets.

While it may take time for the TV-viewing public to become comfortable with searching for and viewing programs from a plethora of new nonprofessional content, an intermediate stage of demand for nonprofessional content from wide new audiences are the so-called blogging or podcasting programs that have become popular on the Internet or by Internet downloading. Such programs are typically created by an author or publisher that has already achieved popular recognition through word-of-mouth or user rave reviews. The equivalent to the blogger or podcaster on the Internet is the "host" or "celebrity" on the TV. The Host provides a recognized face on TV and is relied upon by his/her audience to provide trusted commentary as a filter, reviewer, rater, and/or analyst of information of value. In the present invention, TV programs created by whole new cadres of non-studio or non-network Hosts and other "self-publishers" can be uploaded via Internet for viewing on TV.

Besides a single video segment, an uploaded program may instead be layered in successive hierarchies of segments that can provide viewers with a "drill-down" experience similar to the "drill-down" video ad immersion experience described previously. For example, in FIG. 5, a hosted video blog show has a Host in a presentation segment (topmost in hierarchy) presenting a topic, such as "Live from NYSE, by

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Jim Cramer". The Host can then direct viewers to click on an on-screen menu of choices to select more detailed topical segments, for example, Key "A" for "S&P 500", Key "B" for "NASDAQ", and Key "C" for "Commodities Markets". Upon clicking on Key "B" for "NASDAQ", the VOD system retrieves the video segment "/Live from NYSE by Jim Cramer !NASDAQ" and displays that video segment to the viewer. The topical segment may have other layers of subtopical segments, for example, Key "A" for "/Feature: Apple Computer", Key "B" for "/Feature: Google", and Key "C" for "/Feature: Microsoft", and so on. As a preferred mode of implementation, the hierarchical video segments are presented and linked in templated VOD displays, as previously described with respect to FIG. 1C, with the menu of options displayed as buttons on the template frame. In the same manner, the Host can also serve to link the viewer to other Host programs or other VOD-listed programs by an on-screen menu of options selectable by keys on the remote control unit.

As an added feature, the above-described VOD EPG with titles categorized in the hierarchical addressing scheme of categories and subcategories can be configured to enable a viewer to store bookmarks for desired VOD-listed TV programs for viewing again or sharing with friends. FIG. 6 is a diagram illustrating the logic flow for using an EPG to enable a viewer to store TV bookmarks for desired VOD-listed TV programs. In Step 601, the viewer selects (highlights) a video content title in the EPG to be bookmarked and enters the key for the on-screen option "Store Bookmarks". In Step 602, a prompt requests the viewer to enter a previously registered Personal Identification Number (PIN) identifying that user, and upon the user entering the PIN number and pressing the "Select" or "Enter" key, the VOD system checks to validate the user's PIN with the registered users for that set top box address.

Upon validating the user, in Step 603, a menu of options is displayed, from which the viewer can select "Bookmark it now". Other options include B: "Send TV Friend, C: "Related Programs", and D: "Bibliographic Information". Option B: "Send TV Friend" is discussed further below. Option C: "Related Programs" is an option where the VOD system can suggest titles related to the one highlighted by the viewer for browsing for further interest. Option D: "Bibliographic Information" allows the viewer to read background information on the highlighted title. Upon bookmarking, in Step 604, the VOD system confirms the bookmark by displaying the latest bookmarked title at the top of the list of bookmarked titles entered by the user. Other options are presented for the viewer to manage the list of bookmarks, such as A: "Play", B: "Delete", C: "Clear All", D: "Send to Net" (described further below).

In order to provide functionality to share video programs with a friend, the VOD system can also enable a viewer to share bookmarks with a friend who is also a TV subscriber in the same service area of the digital TV service provider. FIG. 7 is a diagram illustrating an example of sharing TV bookmarks with other subscribers via an on-screen Contact List maintained for the Viewer. In Step 603 of FIG. 6, the viewer can select option "B" to "Send TV Friend", and the VOD system in Step 701 displays options for selecting the viewer's TV friends to receive bookmarks, including A: Select from directory, B: Select from Contact List returns, and C: Select Group.

If option "A" in Step 701 is selected, the VOD system displays in Step 702 a directory of subscriber names in that service area which can be scrolled through using an on-screen keyboard to input the beginning letters of last names.

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Upon the viewer entering the beginning letters of a last name, the directory jumps to the section listing those names and shows the first names or User ID names for any previously registered "User A", "User B", etc., for the bookmarking service. The viewer can then select the other TV subscriber the bookmark is to be sent to, and then click option A: "Send" or B: "Add to List & Send". In option "B", the highlighted name is automatically added to the viewer's Contact List (see following). If option "B" in Step 701 was selected, the VOD system displays in Step 703 an alphabetical Contact List of subscriber names/users previously entered (or automatically added by sending) by the viewer. The viewer can highlight the friend's name/user, and click A: "Send". Other options include B: "Delete" and C: "Add to Groups". If option "c" in Step 701 was selected, the VOD system displays in Step 704 a listing of Groups (by number) having individual names/users previously entered by the viewer.

As a further TV-controlled functionality to share video programs with a friend, the VOD system can also enable a viewer to share bookmarks with other friends and contacts on the Internet. This requires traversing the boundary between the digital TV service and the Internet. FIG. 8 is a diagram illustrating an example of sharing TV bookmarks with others online by transmission of bookmark data to the viewer's email address. If the viewer selected option "D" in Step 701 of FIG. 7, the VOD system displays a list of previously entered email addresses entered for the subscriber household, and also an input box for a new or changed email address. Upon highlighting or entering the intended email recipient and clicking "Send" in Step 801, the request from the viewer's set top box is returned to the Digital TV System and routed to the Web-based Content Management System 40 or other web-based server with Internet connectivity for sending the TV bookmark(s) to the indicated email address which is received and accessed on the recipient's PC or other email-enabled device.

Going from Internet to the TV, in Step 802, a PC user can share TV bookmarks received by email on the PC with other contacts and friends whose email addresses are maintained in an address book or contact list on that person's email client. The PC user can also send TV bookmarks found in searching a website for program listings offered by the Digital TV System to their own Viewer Bookmarks file(s) or to those of other TV subscribers. The PC user simply logs on via Internet to the Web-based Content Management Server 40 for the Digital TV System and selects an option to send the TV bookmark(s) to the Viewer's Bookmark file(s) 604 for that person's subscriber name/user, or to the name/user of any other TV subscriber.

The capability for Internet uploading and automatic listing in any VOD EPG opens VOD programming in digital TV systems to greatly expanded audiences of non-studio, non-professional video authors and publishers. The new publishers also become new viewers, reviewers, commentators, and celebrities to accelerate the "network effect" of expanded viewing on TV. The digital TV service provider can charge smaller but greatly multiplied VOD program placement fees to the new audiences of non-studio, non-professional video authors and publishers. Programs that rise above the crowd due to popularity may attract advertising and sponsorships placements that provide additional revenues for the digital TV service provider and the publisher. With future expansion of VOD "channel" capacity, the system can be opened to broad masses of "citizen" publishers. Popular "blogs", "themes", "social networks", or "knowledge networks" created on VOD channels may



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attract advertising and sponsorships to the digital TV service provider. The placement fees charged for the broad masses of other programs may be reduced or enhanced by “carve backs” funded by automatic digital ad insertions or “pre-rolls” inserted before the program and paid to the publisher. The digital TV service provider can provide value-added services to publishers justifying program placement fees or revenue-sharing of paid advertising by maintaining “dynamic accounts” for publishers tracking number of views, popularity, length of placement, paid advertising spots, carve back payments, etc. Expanded VOD viewing also can generate additional revenue streams for the digital TV service provider from viewers through gigabyte download fees or by “Premium (VOD) Services” (upper viewer tier) fees.

The extension of TV VOD programming to citizen publishing, and the convergence of Internet searching with sharing of TV program bookmarks, can also stimulate diverse new content publishing sources and supporting hardware and equipment in the converged Internet-TV universe. For example, TV EPGs can be exported to via Internet to Internet-connected digital devices, including digital phones, media players, game consoles, Video iPods™, PDAs, etc., and conversely, TV bookmarks selected from EPGs on the Internet can be imported back into the viewer’s “MyEPG” or “MyVideoLibrary” for their TV through the Web-based Content Management System. This would enable people to freely select, save, bookmark, and share TV programs with friends and contacts between their TV viewing environment and their daily mobile or away-from home environments. Internet-connected DVRs, such as those sold by TiVo, or virtual DVRs offered by the digital TV service provider can also connect Internet searching and bookmark sharing to the viewer’s “MyEPG” or “MyVideoLibrary” for VOD program viewing.

In the above description, a VOD “channel” is a term commonly used for the mechanism by which users access and view VOD content. “Channel” historically refers to linear broadcast channels, and VOD by definition is a non-linear, on-demand experience. When a user accesses a VOD “channel” on a digital television system, they are accessing a digital “virtual channel”, where the tuning of the channel number triggers the digital set top box to load and execute an interactive application that is presented on the television. This application will present the categories, sub-categories and titles of VOD content that is available for viewing. The user navigates through the application using the remote control, traversing the hierarchy used to organize the VOD content. When the user selects a VOD title for playback, the digital VOD content is transmitted from a VOD server to the set top box using a dedicated data stream. The actual mechanisms for transmission vary for different digital television system technologies, but in all cases the stream is unicast to the specific set top box. The set top box receives and decodes the data stream and presents the VOD content on the television. A digital television system can support many VOD “channels”, where each “channel” is an interactive application that offers VOD content that has been grouped together by topic, sponsor, content producer or other attributes. As available bandwidth increases in digital television systems, there will be an increase in quantity of the VOD “channels” available to the user, as content producers migrate from the linear broadcast format to the non-linear on-demand format. Correspondingly, as the processing power of set top boxes increases, combined with greater network bandwidth, the sophistication of the interactive applications supporting VOD “channels” will

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increase, offering enhanced ways for interacting with the content and the producer, as well as offer related content and materials, transactions and other methods for engaging the user more completely with the content.

It is understood that many modifications and variations may be devised given the above description of the principles of the invention. It is intended that all such modifications and variations be considered as within the spirit and scope of this invention, as defined in the following claims.

What is claimed is:

1. An Internet-connected digital device for receiving, via the Internet, video content to be viewed by a subscriber of a video-on-demand system using a hierarchically arranged electronic program guide,

the Internet-connected digital device being configured to obtain and present to the subscriber an electronic program guide as a templated video-on-demand display, which uses at least one of a plurality of different display templates to which the Internet-connected digital device has access, to enable a subscriber using the Internet-connected digital device to navigate in a drill-down manner through titles by category information in order to locate a particular one of the titles whose associated video content is desired for viewing on the Internet-connected digital device using the same category information as was designated by a video content provider in metadata associated with the video content; wherein the templated video-on-demand display has been generated in a plurality of layers, comprising:

(a) a first layer comprising a background screen to provide at least one of a basic color, logo, or graphical theme to display;

(b) a second layer comprising a particular display template from the plurality of different display templates layered on the background screen, wherein the particular display template comprises one or more reserved areas that are reserved for displaying content provided by a different layer of the plurality of layers; and

(c) a third layer comprising reserved area content generated using the received video content, the associated metadata, and the associated plurality of images to be displayed in the one or more reserved areas in the particular display template as at least one of text, an image, a navigation link, and a button,

wherein the navigating through titles in a drill-down manner comprises navigating from a first level of the hierarchical structure of the video-on-demand content menu to a second level of the hierarchical structure to locate the particular one of the titles, and

wherein a first template of the plurality of different display templates is used as the particular display template for the templated display for displaying the first level of the hierarchical structure and wherein a second template of the plurality of different display templates is used as the particular display template for the templated display for displaying the second level of the hierarchical structure,

wherein the received video content was uploaded to a Web-based content management system by a content provider device associated with the video content provider via the Internet in a digital video format, along with associated metadata including title information and category information, and along with an associated plurality of images designated by the video content provider, the associated metadata specifying a respective hierarchical location of a respective title of the video content within the electronic program guide to be



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displayed on the Internet-connected digital device using the respective hierarchically-arranged category information associated with the respective title, wherein at least one of the uploaded associated plurality of images designated by the video content provider is displayed with the associated respective title in the templated video-on-demand display.

2. The Internet-connected digital device of claim 1, wherein the associated plurality of images that are received includes at least one of graphic, video and audio elements.

3. The Internet-connected digital device of claim 1, wherein the plurality of different display templates for display with the electronic program guide are used to locate the particular one of the titles in a drill-down manner from a first level of a hierarchical structure of the electronic program guide to a second level of the hierarchical structure of the electronic program guide, wherein a first of the plurality of different display templates is used for displaying the first level of the electronic program guide and wherein a second of the plurality of different display templates is used for displaying the second level of the electronic program guide.

4. The Internet-connected digital device of claim 1, wherein at least a first display template of the plurality of different display templates is associated with at least the video content provider.

5. The Internet-connected digital device of claim 1, wherein the associated metadata includes descriptive data about the video content.

6. The Internet-connected digital device of claim 1, wherein the one or more category terms associated with the first video-on-demand program content correspond to one or more topics that pertain to video-on-demand program content from more than one content provider.

7. The Internet-connected digital device of claim 1, wherein the one or more category terms associated with the first video-on-demand program content correspond to one or more content providers and wherein the hierarchically arranged electronic program guide is organized according to the content provider.

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8. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device is a set top box.

9. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device uses the Internet Protocol.

10. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device is configured to be used with an Internet Protocol TV (IPTV) system.

11. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device is a digital phone.

12. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device is a personal digital assistant (PDA).

13. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device is a media player.

14. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device is a game console.

15. The Internet-connected digital device of claim 1, wherein the Internet-connected digital device is further configured to receive a selection from the subscriber to bookmark a selected title and to store an electronic guide location address for the video-on-demand program associated with the selected title as an electronic bookmark for later viewing.

16. The Internet-connected digital device of claim 15, wherein the Internet-connected digital device is further configured to send the electronic bookmark from the Internet-connected digital device to a second Internet-connected digital device.

17. The Internet-connected digital device of claim 15, wherein the Internet-connected digital device is further configured to transmit an email including the stored electronic bookmark to an email address of a user on the Internet.

\* \* \* \* \*

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(12) **United States Patent**  
**Perez**

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(45) **Date of Patent:** **\*May 15, 2018**

(54) **DYNAMIC ADJUSTMENT OF ELECTRONIC PROGRAM GUIDE DISPLAYS BASED ON VIEWER PREFERENCES FOR MINIMIZING NAVIGATION IN VOD PROGRAM SELECTION**

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(57) **ABSTRACT**

Items of video content offered for viewing on a video-on-demand (VOD) platform of a digital TV service provider are each assigned a respective title and hierarchical address corresponding to hierarchically-arranged categories and subcategories within which the title for the video content is to be categorized. The title is listed in a location of an electronic program guide (EPG) using the same categories and subcategories as its hierarchical address. Any TV subscriber can access the EPG and navigate through its categories and subcategories to find a title for viewing on the TV. The EPG dynamically adjust its display listings of each level of categories, subcategories, and titles in order to minimize the number of remote control keypresses needed for a viewer to navigate to a title of interest. In one basic form, the EPG display is reordered by listing more frequently visited categories or subcategories first, and other less frequently visited categories or subcategories lower on the listing or out-of-sight on another page of the display.

**18 Claims, 16 Drawing Sheets**

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**H04N 21/472** (2011.01)

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(52) **U.S. Cl.**

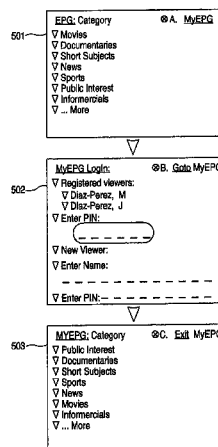
CPC ... **H04N 21/4821** (2013.01); **H04N 21/25891** (2013.01); **H04N 21/44222** (2013.01);

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(58) **Field of Classification Search**

None

See application file for complete search history.



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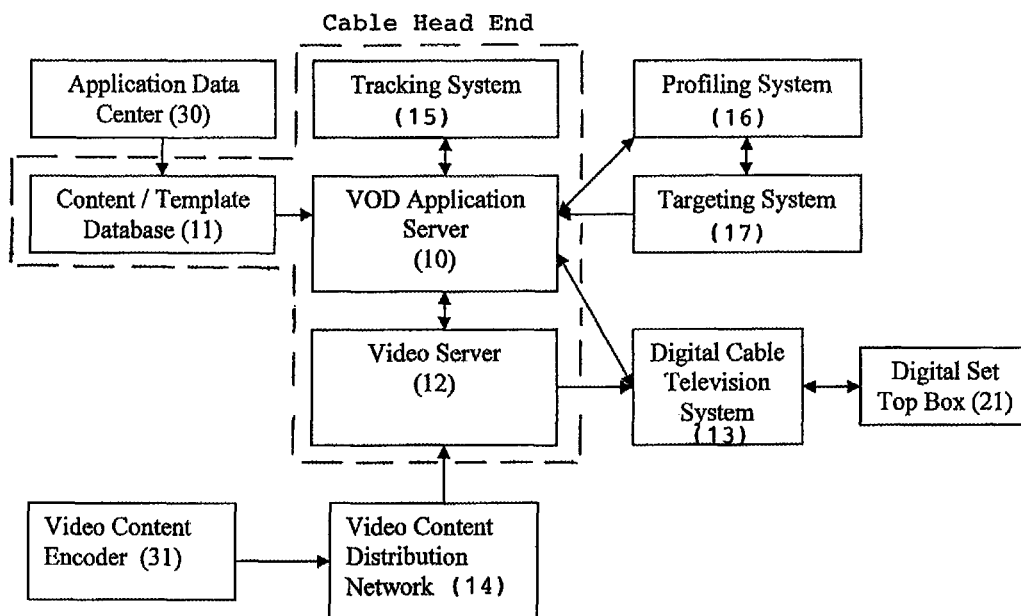


Figure 1A: VOD Content Delivery System, Overall Architecture



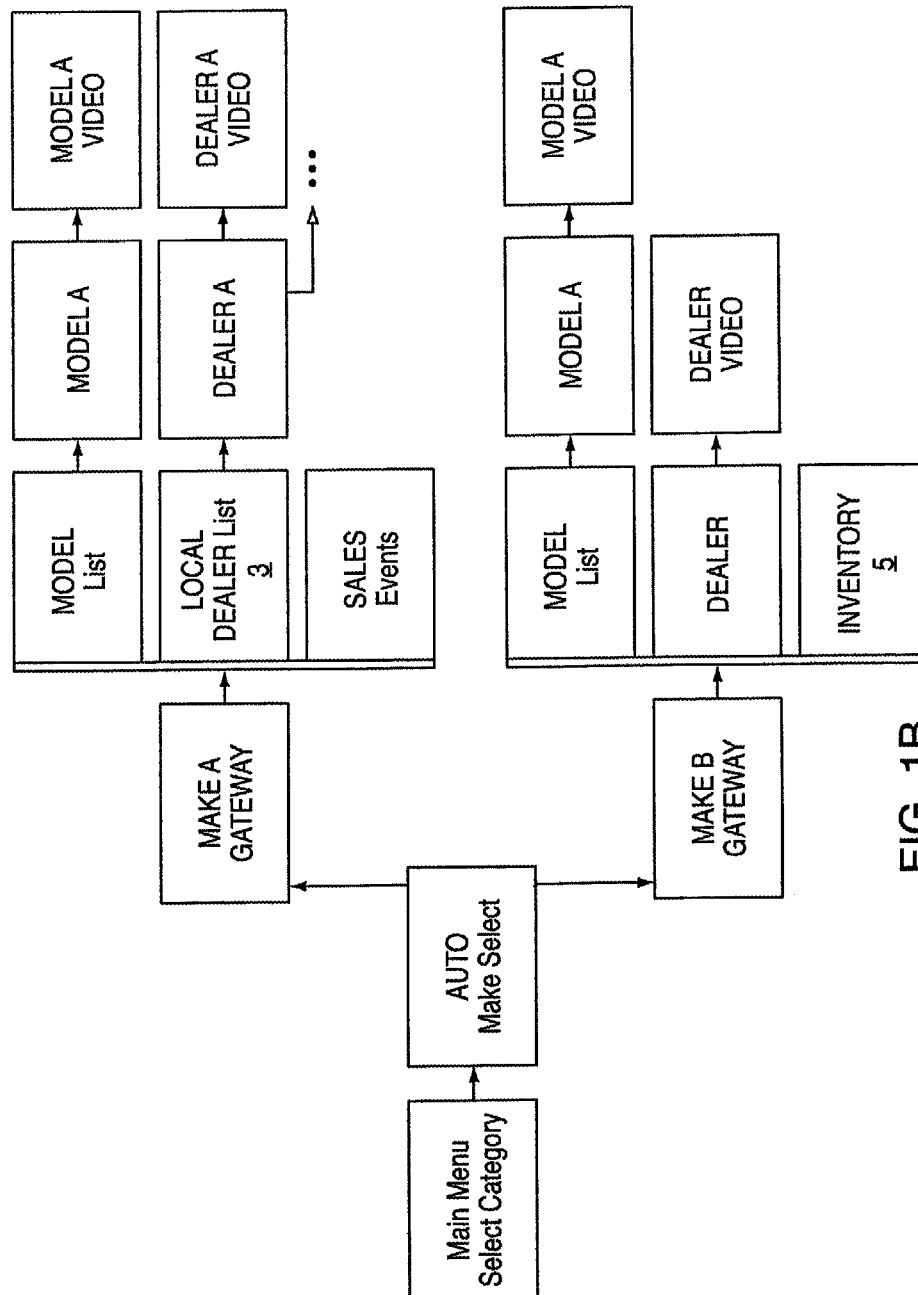
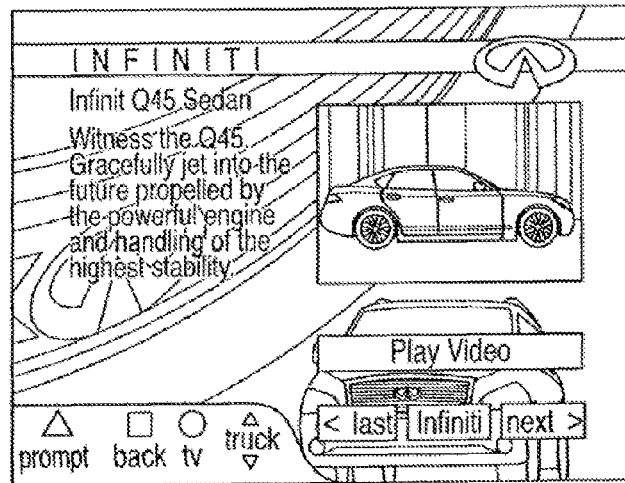
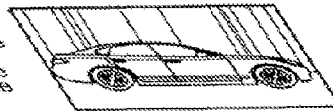


FIG. 1B



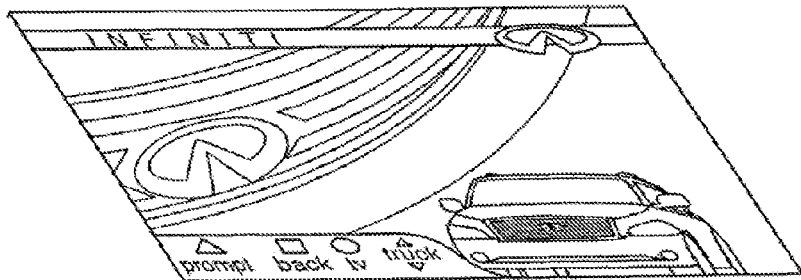
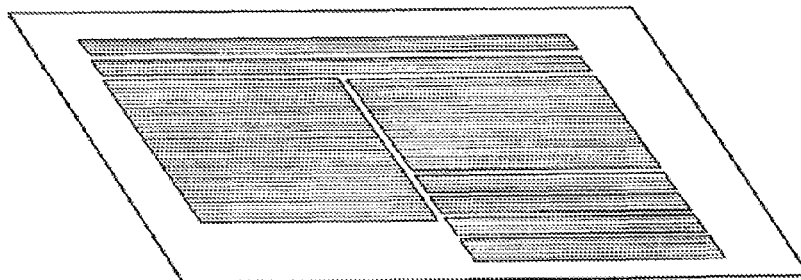
Infiniti Q45 Sedan  
Witness the Q45.  
Gracefully jet into the  
future propelled by  
the powerful engine  
and handling of the  
highest stability.



Play Video

< last Infiniti next >

FIG. 1C



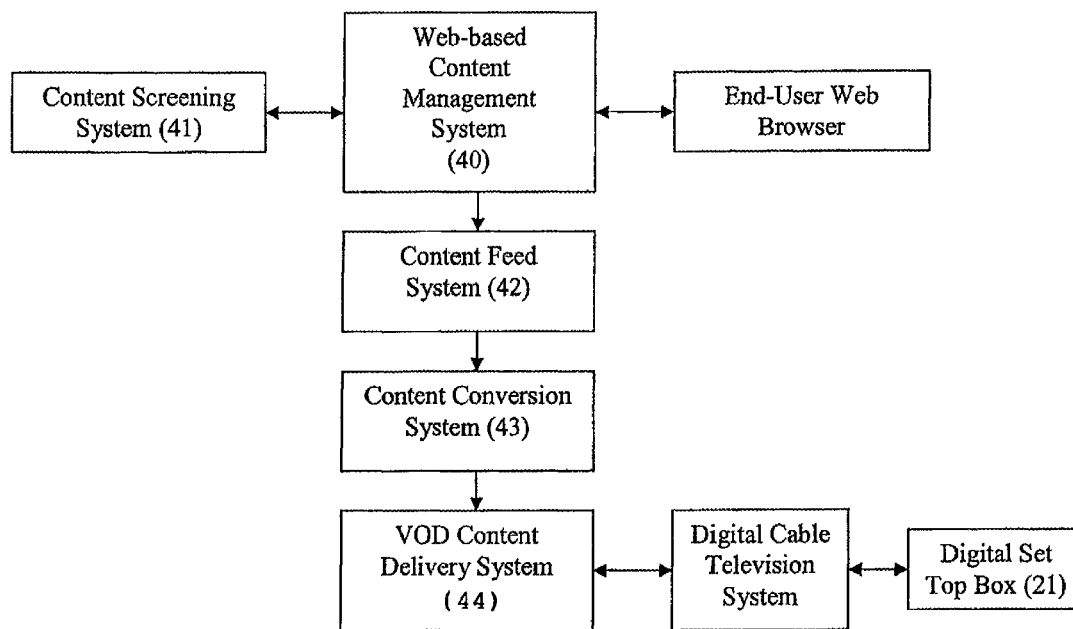


Figure 2A: Classified Ad System, Overall Architecture

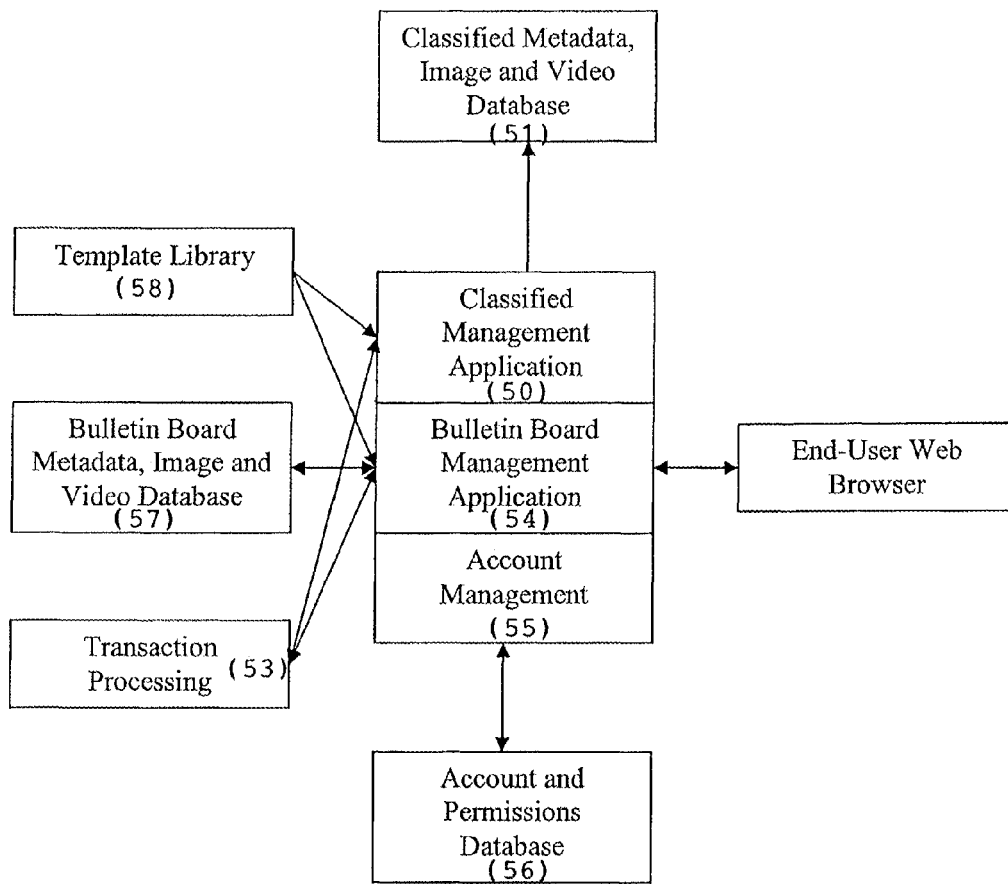


Figure 2B: Web-based Content Management System

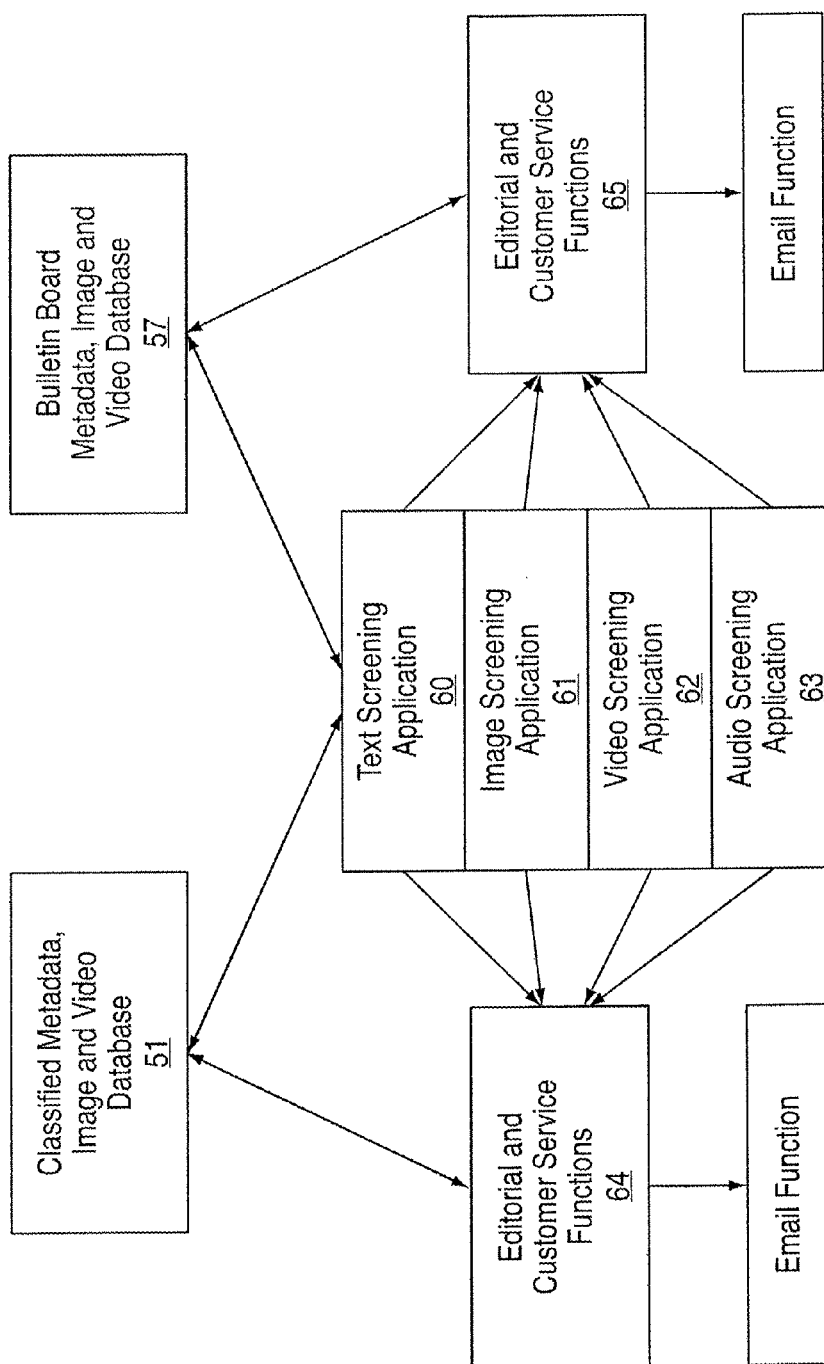
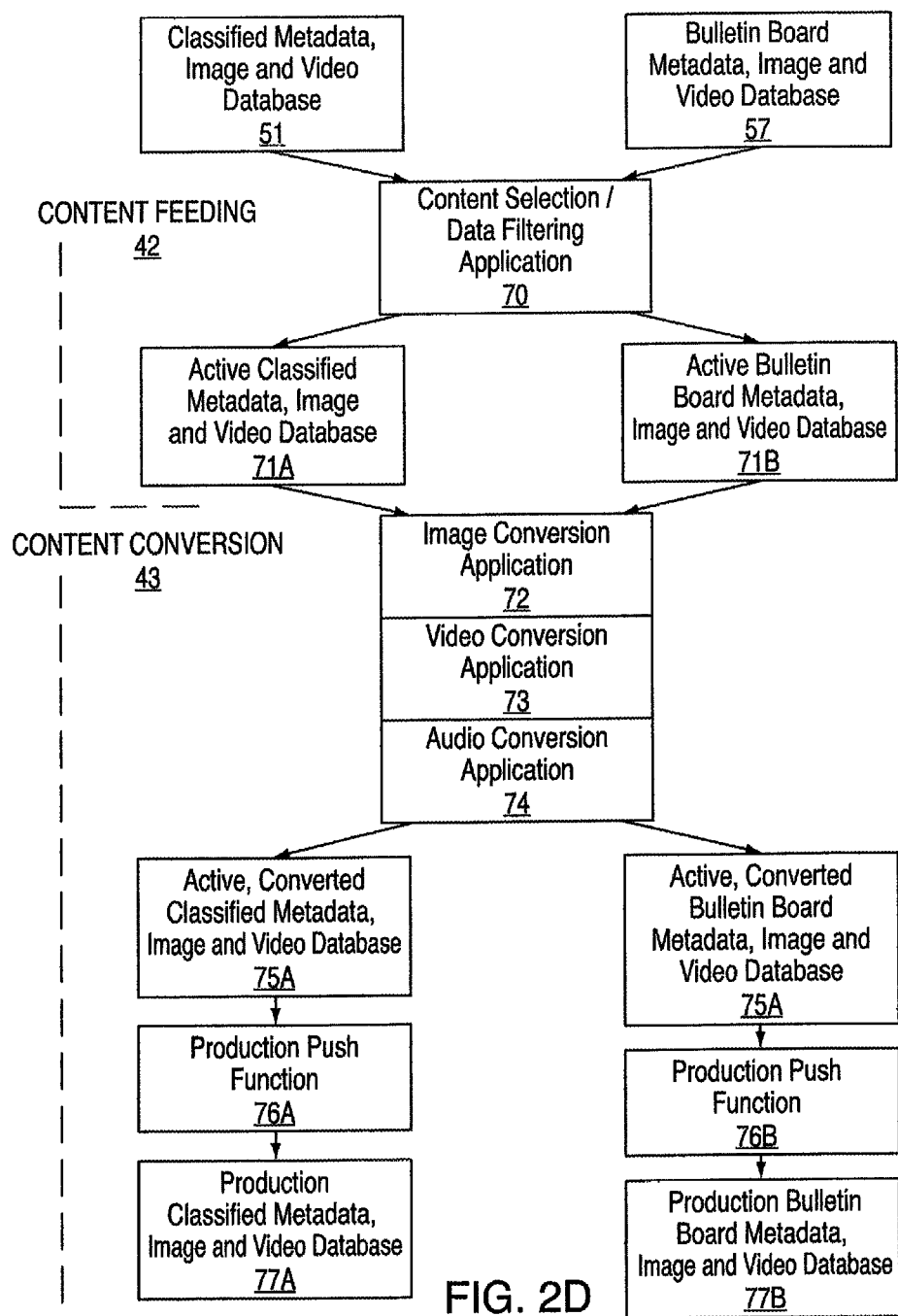


FIG. 2C



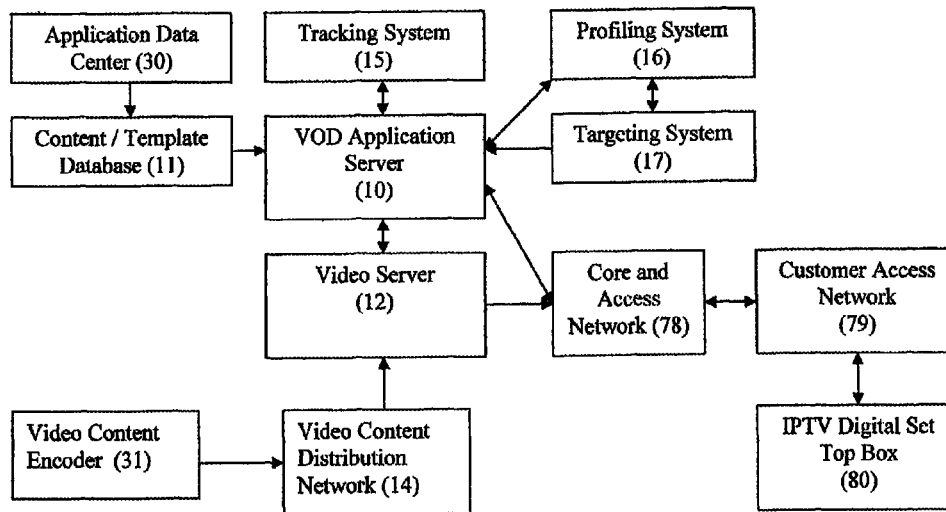


Figure 3: VOD Content Delivery System, Overall Architecture for IPTV System

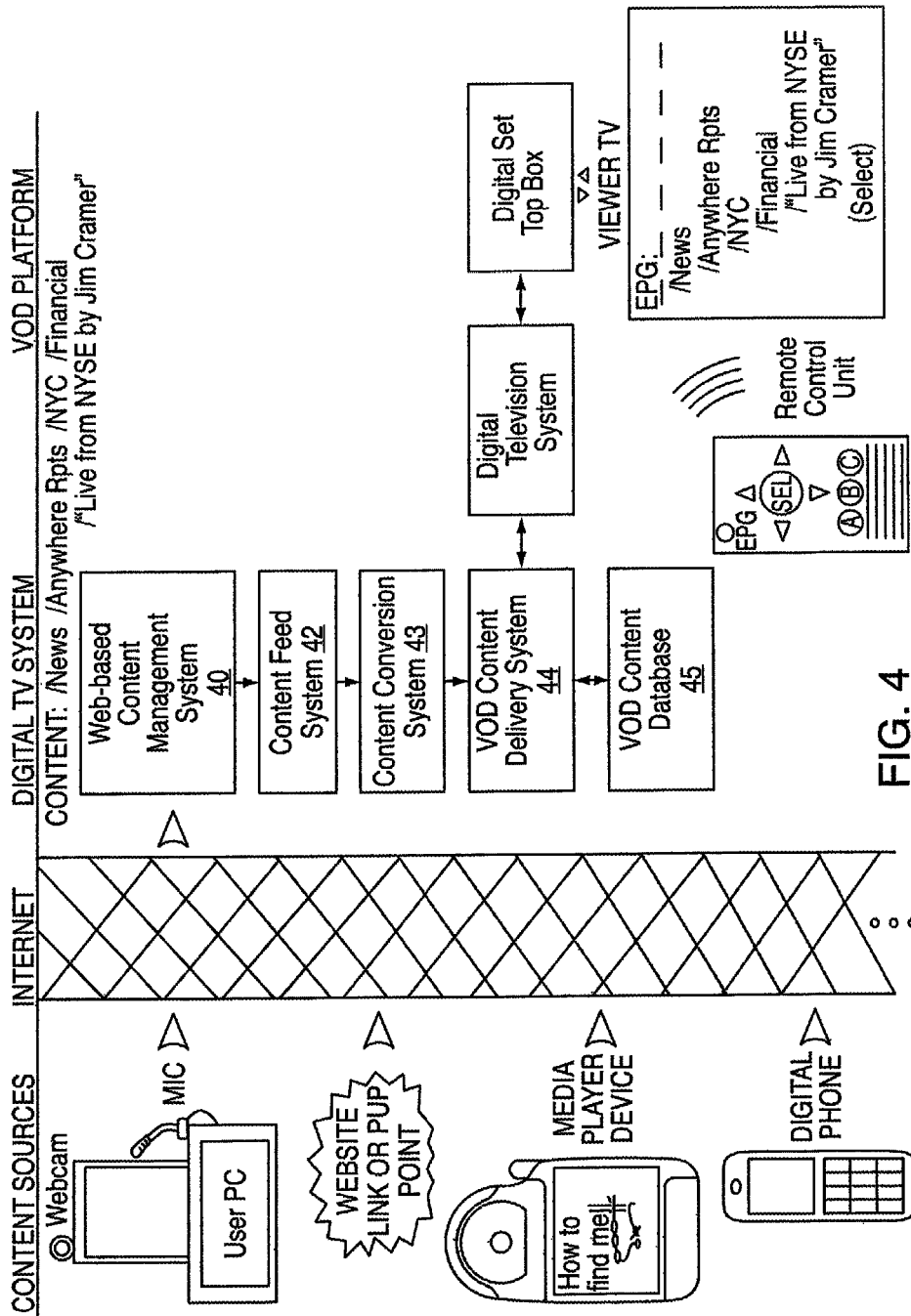
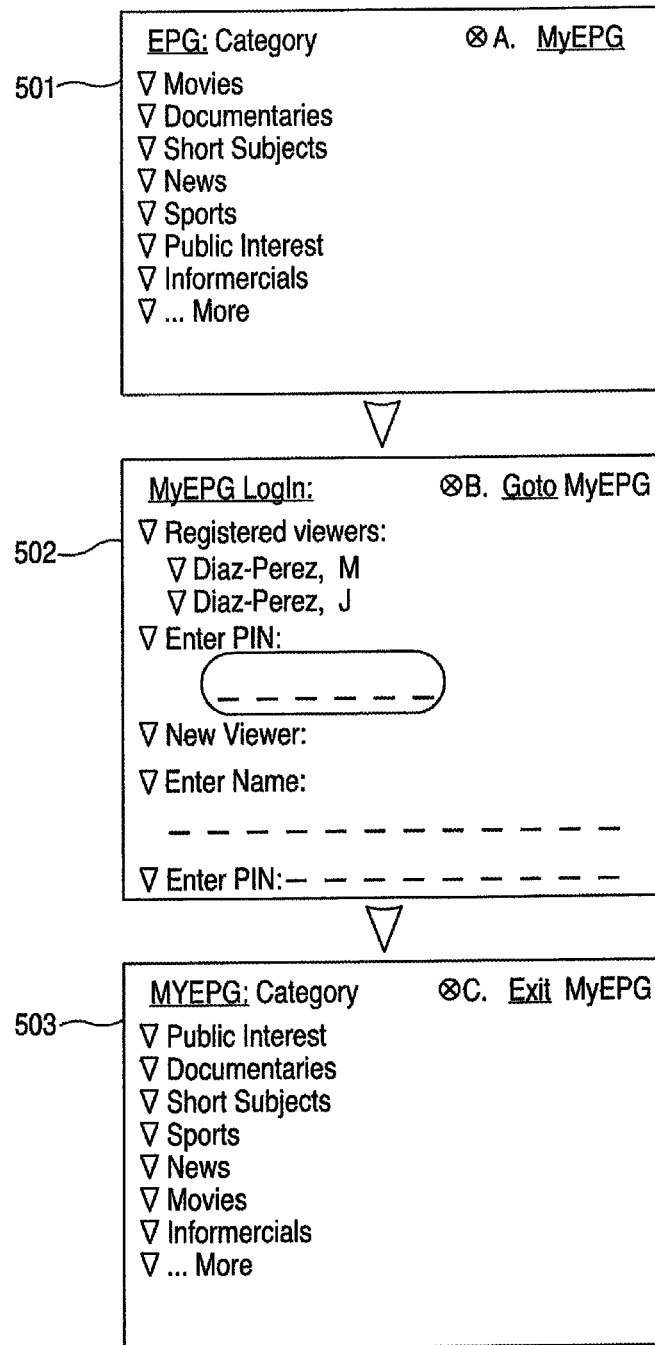


FIG. 4





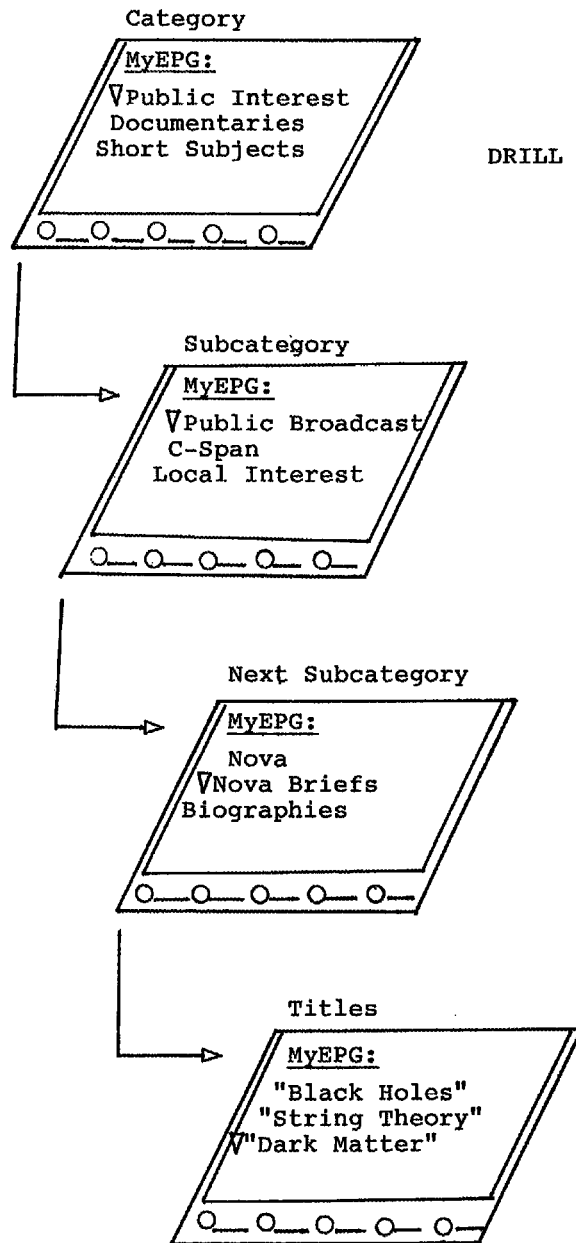


FIG. 6  
DRILL DOWN EPG NAVIGATION

Hierarchical Address: /Public Interest/PBS/NovaBriefs/"Dark Matter"

Fig. 7A  
REORDERING EPG DISPLAYS  
PROCESS LEVEL

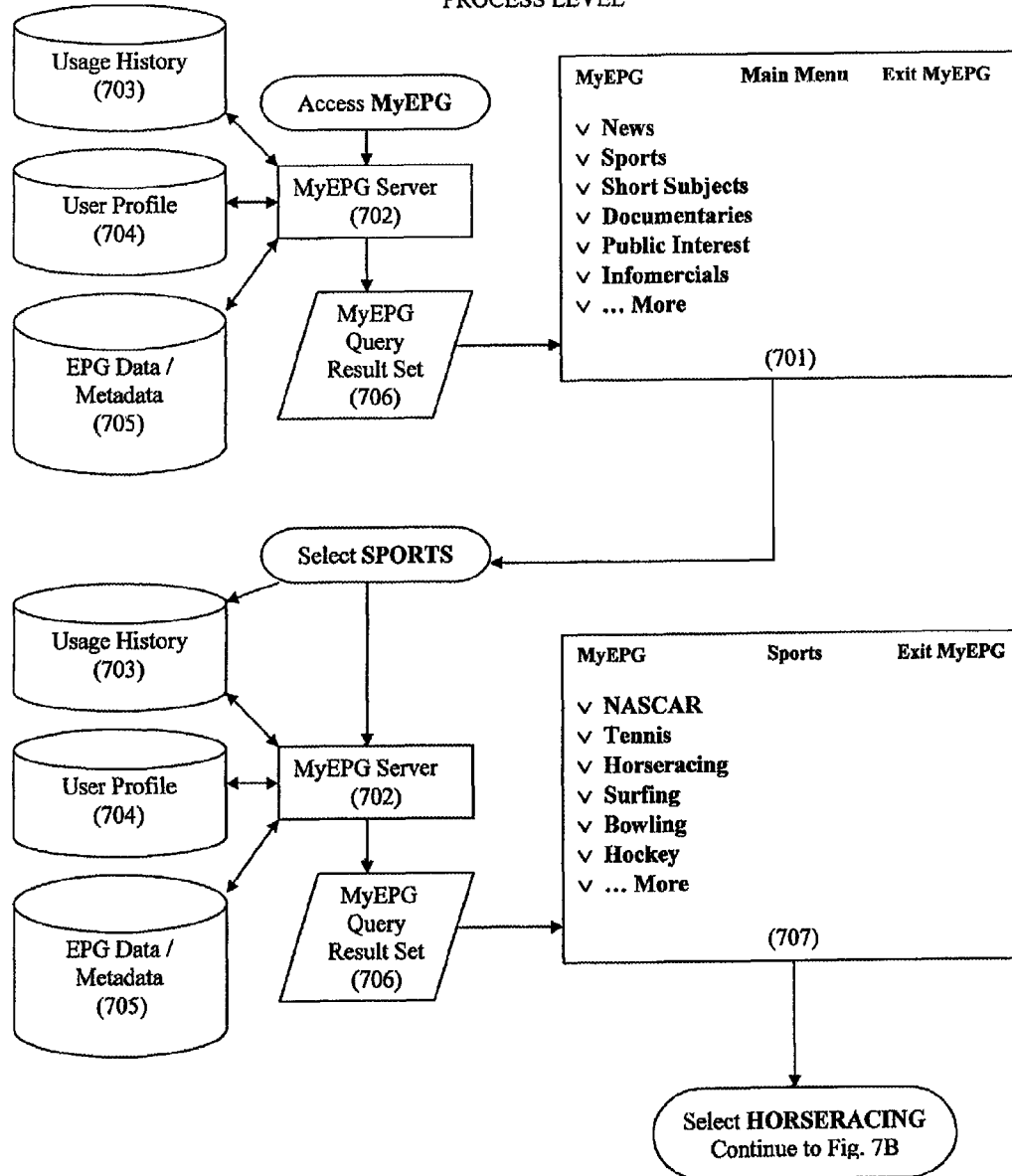


Fig. 7B  
REORDERING EPG DISPLAYS  
PROCESS LEVEL (cont.)

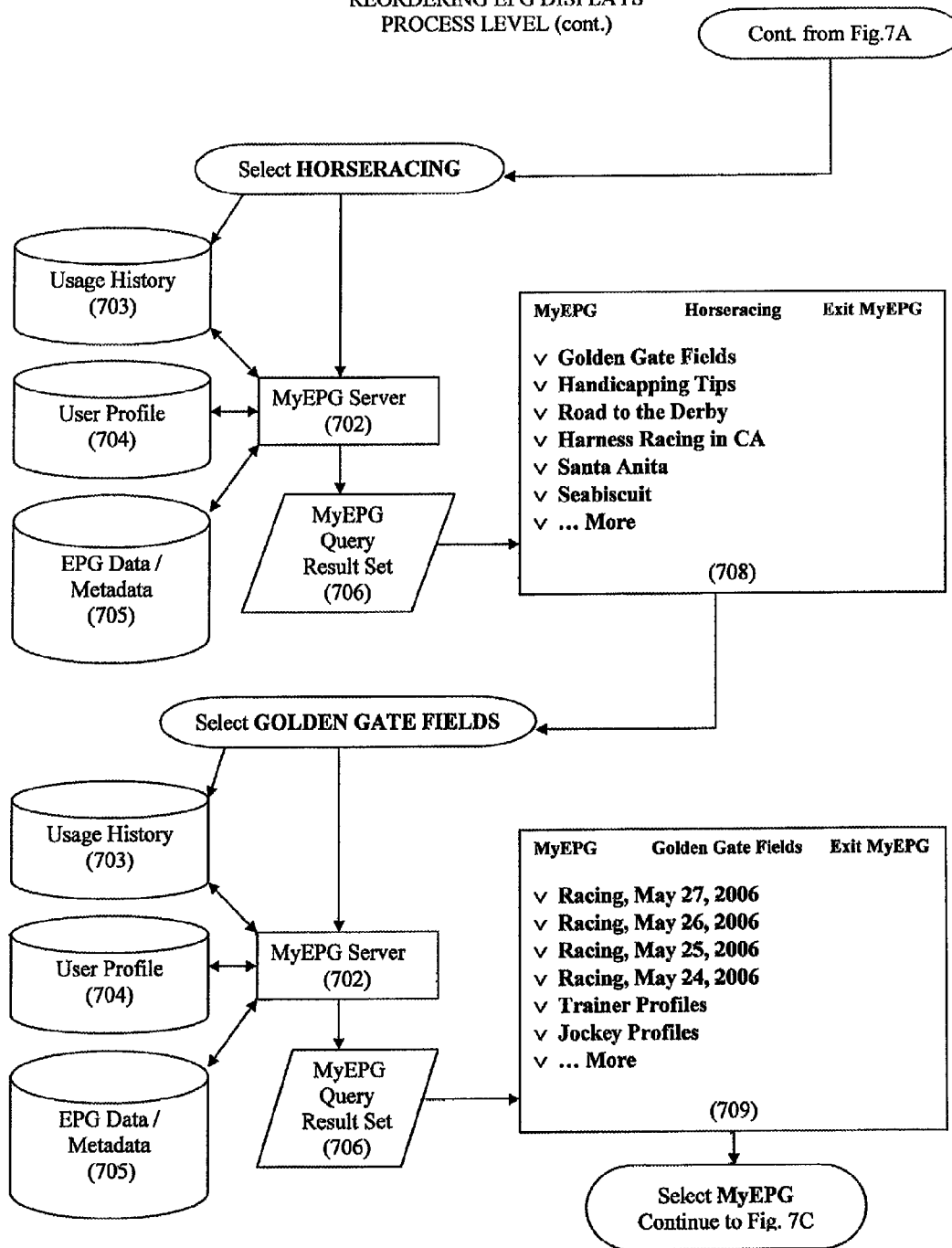


Fig. 7C  
REORDERING EPG DISPLAYS  
PROCESS LEVEL (cont.)

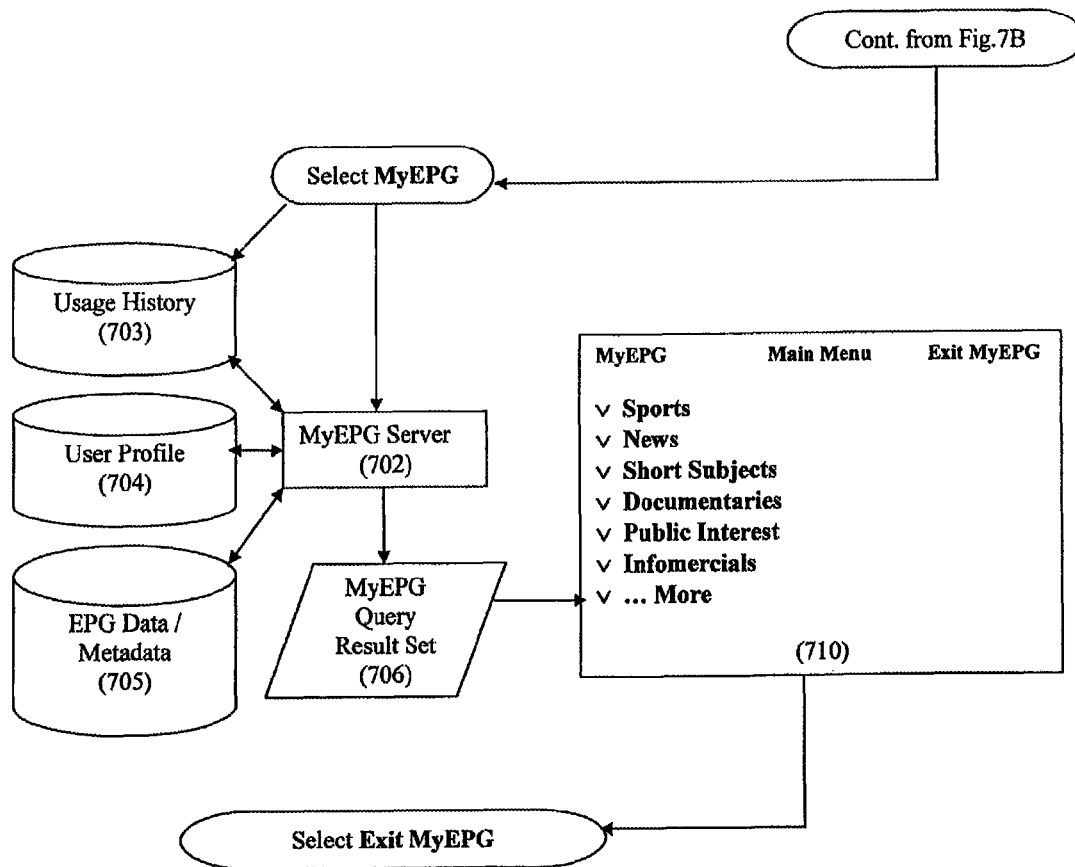
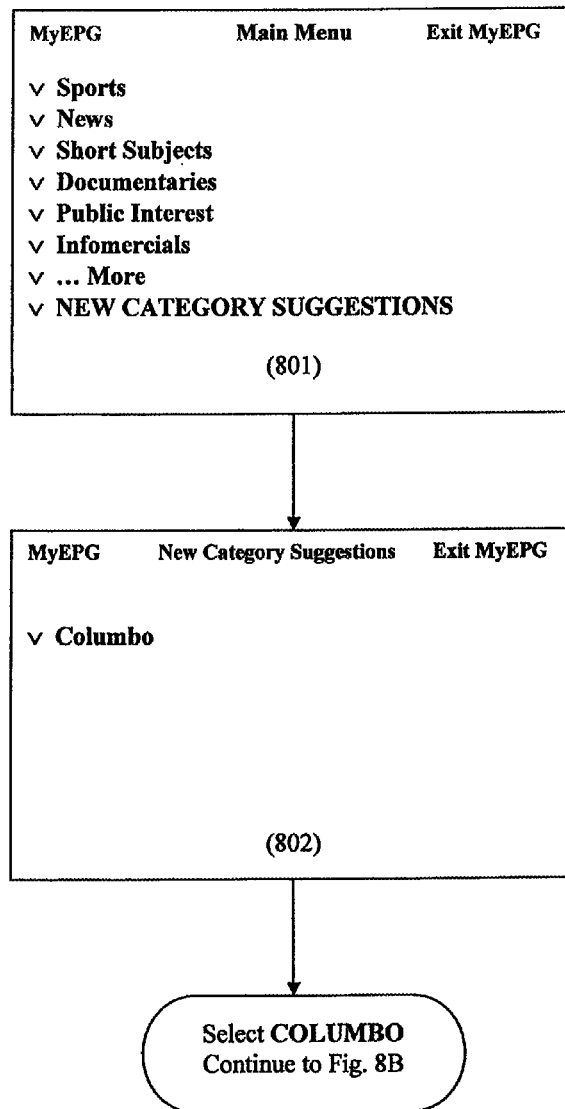


Fig. 8A  
MyEPG CATEGORY CREATION



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**Fig. 8B**  
**MyEPG CATEGORY CREATION**

<b>MyEPG</b>	<b>New Category Confirmation</b>	<b>Exit MyEPG</b>
<b>Columbo</b>		
✓ Press 1 to accept new category		
✓ Press 2 to reject new category		
(803)		

<b>MyEPG</b>	<b>Main Menu</b>	<b>Exit MyEPG</b>
✓ Sports		
✓ Columbo		
✓ News		
✓ Short Subjects		
✓ Documentaries		
✓ Public Interest		
✓ ... More		
(804)		

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# **DYNAMIC ADJUSTMENT OF ELECTRONIC PROGRAM GUIDE DISPLAYS BASED ON VIEWER PREFERENCES FOR MINIMIZING NAVIGATION IN VOD PROGRAM SELECTION**

This U.S. patent application is a continuation application claiming the benefit of co-pending U.S. patent application Ser. No. 11/768,895, filed on Jun. 26, 2007. This application is further related to U.S. patent application Ser. No. 11/685,188 filed on Mar. 12, 2007, issued as U.S. Pat. No. 7,631,336 on Dec. 8, 2009, and U.S. patent application Ser. No. 10/909,192 filed on Jul. 30, 2004, issued as U.S. Pat. No. 7,590,997 on Sep. 15, 2009, all being by the same inventor and incorporated in their entirety by reference as if fully set forth herein.

## **TECHNICAL FIELD**

This invention generally relates to the provision of video content to viewers through digital TV infrastructure, and more particularly, to converting, navigating and displaying video content uploaded from the Internet on a digital TV video-on-demand platform.

## **BACKGROUND OF INVENTION**

Cable television (CATV) systems are used to deliver television services to a vast majority of TV-viewing homes in the U.S. and other technologically advanced countries. The typical CATV system has a cable service provider head end equipped with video servers to transmit CATV program signals through distribution cable lines to local nodes and from there to TV subscriber homes. Within the subscriber homes, the CATV input TV line is connected to one or more customer-premises TVs which are coupled to external set-top boxes for channel tuning or are equipped with internal cable channel tuners. CATV service providers employ the spacious 1 GHz bandwidth of the typical cable (RG-6) line to carry tens of analog TV channels in the portion of the cable bandwidth allocated to analog TV signals. With digital multiplexing methods such as QAM, hundreds of digital TV signals can be carried simultaneously in the portion of the cable bandwidth allocated to digital TV signals. Cable TV service providers have also allocated portions of the cable bandwidth for user (return) data, broadband data connection, and voice-over-IP (VoIP) digital telephone service.

Cable TV service providers generally offer subscribers to subscribe to any of several tiers of bundled TV services on a scale with increasing rates in accordance with signal quality, TV program offerings, and types of interactive services. Digital TV services are offered through advanced digital set-top boxes that are individually addressable from the CATV head end, and also allow subscribers various interactive functions with the CATV head end via inputs to the set-top box via the remote control unit for transmission on the return data path to the CATV head end.

A recent type of interactive television service offered on digital TV systems is referred to generally as a "video-on-demand" (VOD) system, wherein a viewer can navigate through a program guide via the remote control unit and send a request via the set-top box for a desired video program to be addressed from the head-end to the subscriber's set-top box for display on the TV. Different types of VOD programs are typically bundled as a package and offered on different VOD "channels". For example, a VOD "channel" can offer on-demand movies and videos, replay

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sports events, infomercials, advertisements, music videos, short-subjects, and even individual TV "pages". VOD-based interactive television services generally allow a viewer to use the remote control to cursor through an on-screen menu and select from a variety of titles for stored video programs for individual viewing on demand. Advanced remote control units include button controls with VCR-like functions that enable the viewer to start, stop, pause, rewind, or replay a selected video program or segment. In the future, VOD-based interactive television services may be integrated with or delivered with other advanced interactive television services, such as webpage browsing, e-mail, television purchase ("t-commerce") transactions, and multimedia delivery.

Digital cable TV is currently the most prevalent system for offering digital TV services to home TV subscribers. However, other types of digital carriers offering broadband connections to subscriber homes have entered into competition with cable TV providers by offering digital TV services over their broadband connections. Examples of other broadband connections include DSL telephone lines, local area broadband networks, and wireless broadband networks. Digital television services offered on such broadband connections employ the TCP/IP data transport protocol and are referred to as Internet Protocol Television (IPTV). Instead of multi-casting all TV program signals into a cable line, the typical IPTV system will respond to a subscriber's request for a particular TV channel or video program by transmitting the video content individually to the subscriber's individually addressable, digital set top box at high speeds. IPTV and digital cable TV both transmit digital video in packetized data streams within closed, proprietary broadband systems; however, IPTV uses the Internet Protocol (IP) to structure, route and deliver the digital video packets within an IPTV system.

With the increasing interactive functionality and customer reach of interactive television services, advertisers and content providers are finding it increasingly attractive to employ on-demand advertising, on-demand program content, and on-demand TV transactions for home viewers. VOD content delivery platforms are being designed to seamlessly and conveniently deliver a wide range of types of advertising, video content, and transaction services on demand to home viewers. VOD content offerings are expected to increase dramatically from a few "channels" with a few score or hundred "titles" listed on each today to scores or hundreds of channels with thousands if not millions of titles on each in the foreseeable future. The VOD platform thus offers a gateway for greatly expanding TV viewing from a relatively small number of studio-produced program channels to a large number of new commercial publishers and ultimately a vast number of self-publishers or so-called "citizen" content publishers. It is deemed desirable to find a way for such vast numbers of content publishers to transmit their programs to the home TV, and to enable home TV viewers to find something of interest for viewing among the vast numbers of new programs.

## **SUMMARY OF THE INVENTION**

In accordance with the present invention, a method for dynamic adjustment of an electronic program guide (EPG) for navigating to video content offered on a video-on-demand (VOD) platform of a digital TV service provider comprises:



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(a) maintaining a listing of category names for respective categories of video content to which a viewer can navigate using the EPG for the VOD platform;

(b) tracking a viewer's past history of selections of category names for video content in the EPG and determining an order of relevance of the category names for viewer selection of video content based on said past history; and

(c) reordering a current display listing of the category names based on said determined order of relevance.

In a preferred implementation, the order of relevance is determined in order of frequency of selection of category names based on the viewer's past history of category name selection. As an extension, order of relevance may be determined based on other parameters, such as time-of-day, weekday or weekend, or preference indicated by past selections of TV program titles. The reordered EPG display listing may list a predetermined number of category names of higher relevance, while maintaining all other category names of lower relevance out-of-sight on another display page to be accessed by activating a "More" button.

Each title is categorized within hierarchically-arranged categories and subcategories of the EPG which make up a unique hierarchical address for the title. The hierarchical address may be represented by a string of category and subcategory terms and the title delimited by standard delimiters. The hierarchical address can be shared as bookmarks the TV program with other TV subscribers or friends or contacts on the Internet.

The reordering of category names is provided by linking the viewer from a generalized EPG for all viewers on the VOD platform to a viewer-individualized EPG. The viewer-individualized EPG is accessed through a LogIn step by which the individual viewer is identified. In the LogIn step, the viewers of a subscriber household can register their names and personal identification numbers (PIN) for quick logins. The viewer-individualized EPG tracks the categories and subcategories the individual viewer clicks on and adds it to the viewer's past history. The tracking continues until the viewer logs off or the TV viewing session is ended. Besides reordering, the tracking of viewer navigation clicks and viewing preferences can be used to automatically create subcategories of TV programs of the type most frequently clicked on by the viewer, as well as for reordering in other VOD schema.

The present invention also encompasses an electronic program guide (EPG) for viewer navigation to titles for items of video content stored on a video-on-demand (VOD) platform comprising:

(a) each item of video content being assigned a title and a hierarchical address corresponding to hierarchically-arranged categories and subcategories within which the title for the video content is to be categorized;

(b) a listing of at least a top level of category names for respective categories of video content maintained by the EPG for the video content;

(d) a viewer's past history of selections of category names for video content maintained in association with the EPG and used to determine an order of relevance of category names for viewer selection of video content based on said past history; and

(e) a current display listing of category names for the EPG in which the category names are reordered based on said determined order of relevance.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a diagram of an overall architecture for a VOD Content Delivery System in accordance with the present

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invention, FIG. 1B shows an example of templated Drill-Down Ad navigation, and FIG. 1C shows an example of the templated ad display model.

FIG. 2A is a process flow diagram of the overall architecture of a Classified Ad application for the VOD Content Delivery System, FIG. 2B illustrates a Content Management Website for the Classified Ad application, FIG. 2C illustrates a Content Screening Component of the system, and FIG. 2D illustrates a Content Feed and Conversion Components of the system.

FIG. 3 is a diagram of a VOD Content Delivery System adapted to Internet Protocol TV (IPTV) system.

FIG. 4 is a diagram illustrating a process flow for enabling content publishers on the Internet to upload video content to digital television service providers for viewing on the home TV.

FIG. 5 is a diagram illustrating access to an individualized-viewer EPG for tracking a viewer's past history of selection of EPG category names and titles for reordering the EPG for faster navigation.

FIG. 6 is a diagram illustrating implementation of the reordering of EPG display listings using drill-down display templates for reordering the EPG navigation displays.

FIG. 7A is a process flow diagram of the overall architecture of an individualized-viewer EPG as a user navigates the hierarchical levels of program information. FIG. 7B is the continuation of FIG. 7A as the user navigates further into the hierarchy. FIG. 7C is a diagram illustrating the effects of usage data upon the order of content selections within the individualized-viewer-EPG display.

FIG. 8A is a diagram illustrating the recommendation to the user by the individualized-viewer-EPG system of new EPG categories based on viewer behavior. FIG. 8B is the continuation of FIG. 8A as the user navigates further into the hierarchy.

#### DETAILED DESCRIPTION OF INVENTION

The following description describes one preferred embodiment for implementation of the invention in which the digital television service provider is one employing cable TV infrastructure. However, it is to be understood that the principles of the invention are equally applicable to other types of digital television service providers offering digital TV services over other broadband connections such as DSL telephone lines, local area broadband networks, and wireless broadband networks. Similarly, certain examples of VOD applications are described herein, e.g., advertisements that are navigated in "drill-down" fashion, and the uploading of consumer-generated classified ads to be viewed as TV classified ads. However, many other types of video content may be used in programming with this system.

A VOD "channel" is a term commonly used for the mechanism by which users access and view VOD content. "Channel" historically refers to linear broadcast channels, and VOD by definition is a non-linear, on-demand experience. When a user accesses a VOD "channel" on a digital television system, they are accessing a digital "virtual channel", where the tuning of the channel number triggers the digital set top box to load and execute an interactive application that is presented on the television. This application will present the categories, subcategories and titles of VOD content that is available for viewing. The user navigates through the application using the remote control, traversing the hierarchy used to organize the VOD content. When the user selects a VOD title for playback, the digital VOD content is transmitted from a VOD server to the set top box

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using a dedicated data stream. The actual mechanisms for transmission vary for different digital television system technologies, but in all cases the stream is unicast to the specific set top box. The set top box receives and decodes the data stream and presents the VOD content on the television. A digital television system can support many VOD "channels", where each "channel" is an interactive application that offers VOD content that has been grouped together by topic, sponsor, content producer or other attributes. As available bandwidth increases in digital television systems, there will be an increase in quantity of the VOD "channels" available to the user, as content producers migrate from the linear broadcast format to the non-linear on-demand format. Correspondingly, as the processing power of set top boxes increases, combined with greater network bandwidth, the sophistication of the interactive applications supporting VOD "channels" will increase, offering enhanced ways for interacting with the content and the producer, as well as offer related content and materials, transactions and other methods for engaging the user more completely with the content.

Referring to FIG. 1A, an overall system architecture for a VOD content delivery system includes a VOD Application Server **10** located at a Cable Head End. The VOD Application Server **10** manages a Database **11** of templates and video content segments from Video Server **12** for generating templated VOD content. The VOD content is generated in response to a viewer request signal transmitted from the Digital Set Top Box **21** of a viewer's TV equipment through the Digital Cable Television System **13** to the VOD Application Server **10** at the Cable Head End. The VOD Application Server **10** may be of the type which enables any compatibly-developed VOD applications to be loaded on and operated on the server. An example of such a VOD Application Server is the Navic N-Band™ server, offered by Navic Systems, Inc., d/b/a Navic Networks, of Needham, Mass. This is an integrated system which provides an application development platform for third party application developers to develop new VOD service applications, viewer interfaces, and ancillary interactive services for deployment on VOD channels of CATV operators in cable service areas throughout the U.S. A detailed description of the Navic N-Band system is contained in U.S. Patent Application 2002/066,106, filed on May 30, 2002, which is incorporated herein by reference.

Templates for displaying VOD content are created at an Application Data Center **30** and stored in the Database **11** for use by the operative VOD application. The templates may be designed, for example, to present video ad content displays in a logo frame, or to provide navigation buttons and viewer selection options in a frame around currently displayed video content. In the preferred embodiment described in greater detail below, the templates are used to provide navigation aids in a series of progressively more focused ad display types. A Video Content Encoder **31** is used to encode raw video feeds into formatted video content segments compatible with the VOD platform and supply them through a Video Content Distribution Network **14** to the Video Server **12**.

In operation, the VOD Application Server **10** operates a VOD application for the CATV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer's remote control unit transmitting an IR signal to the Set Top Box **21** that is sent on a back channel of the Digital Cable Television System **13** to the VOD

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Application Server **10** at the Cable Head End. In response to the signal, the VOD Application Server **10** determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database **11** and video content segment from the Video Server **12**, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server **10** retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a "drill-down navigation" method to find specific end content of interest.

Referring to FIG. 1B, a preferred embodiment of the templated VOD content delivery system is shown providing a User Interface using Drill-Down Navigation through display ads, such as for automobile infomercials. When the viewer selects a VOD application (channel), such as "Wheels-On-Demand", the viewer's TV displays a Main Menu with buttons inviting the viewer to "Select Category". The viewer can select an "Auto" category, and the TV then displays an "Auto" menu with buttons inviting the viewer to "Select Make", such as Make A, Make B, etc. When the viewer makes a selection, such as Make A, the viewer's TV displays a further menu that is a Gateway into templated VOD content delivery which enables Drill-Down Navigation by templated display ads. Through the Gateway, the VOD Application leaves the Menu mode and enters the Drill Down Navigation mode for successively displays of hierarchically-ordered video content which allow the viewer to navigate to progressively more focused content. In this example, the highest level of the hierarchy includes categories for Model, Local Dealer, Sales Events, and/or Inventory. When the viewer selects a category such as "Model" from the Gateway, for example, the VOD Application creates a templated ad display showing video content generic to all models by that automaker framed in a frame which has links (buttons or choices) for a list of the specific models made by that automaker. When the viewer selects the link to a specific model, "Model A" for example, the VOD Application creates a templated ad display showing video content for Model A, and the viewer can then choose to run a long-form infomercial of the Model A video. Alternatively, the Drill-Down Navigation can continue with further levels of specificity, such as "Custom Packages", "Options", "Colors/Stylings", etc. Similarly, the selection of the "Local Dealer" category from the Gateway can bring up a templated ad for local dealers with links to specific local dealers in the viewer's cable service area, and a click on a specific "Dealer A" can bring up a templated ad for Dealer A with further links to more specific content pertaining to Dealer A, such as "Current Sales Promotions", etc.

In this manner, the templated VOD content delivery system allows the viewer to navigate to specific content of high interest to the viewer using the Drill-Down ads as a navigation tool, while at the same time having a unique visual experience of moving through a series of ads mirroring the viewer's path to the subject of interest. The templated VOD ads are generated dynamically by searching the Content/Template database with each request by a viewer, enabling the system to display updated navigation choices and content simply by updating the database with updated links and video content. For example, if the Auto Maker

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changes the Model types of autos currently available, or if Local Dealer A changes its current sales promotions for autos currently available, that advertiser's ads can be updated with new, template frame navigation links and content, instead of entirely new ads or screen displays having to be shot, produced, contracted, delivered, and programmed with the cable TV company. Many other types of layered or indepth ads, subjects, and interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down Navigation designs.

In FIG. 1C, an example illustrates how a templated VOD display is generated in layers. A Background screen provides a basic color, logo, or graphical theme to the display. A selected Template (display frame) appropriate to the navigation level the intended display resides on is layered on the Background. The Template typically has a frame in which defined areas are reserved for text, display image(s), and navigation links (buttons). Finally, the desired content constituted by associated Text, Image & Buttons is retrieved from the database and layered on the Template. The resulting screen display shows the combined background logo or theme, navigation frame, and text, video images, and buttons.

Referring again to FIG. 1A, a Tracking System 15 of conventional type can be installed at the Cable Head End to aggregate non-personal data on what channels and programs viewers watch. For the Drill Down Navigation method, the Tracking System 15 can include tracking of the navigation paths viewers use to find subjects of interest in a VOD Application. The aggregation of viewer navigation data can indicate what subjects are most popular, whether some subjects are of greater interest to viewers at certain times of day, of certain demographics, or in relation to certain products or services. The VOD Application Server 10 can export the aggregated viewer navigation data to an external Profiling System 16, such as a non-biased or unrelated firm applying profile analysis methods. The results of the Profiling System 16 can be communicated to a Targeting System 17, such as a template design firm or content production company, to fine-tune the presentation of the templated VOD content consistent with viewer preferences or interests. The feedback from the Targeting System can be supplied as feedback to the VOD Application Server to modify the Content/Template Database 11.

Another application for the templated VOD content delivery system can be developed to support video advertisements which link national to local market ad campaigns in "drill-down" fashion. Advertisers, both national and local, can pay for placement of their video advertisements on the system. When the VOD Application is run, the national ads are displayed as a Gateway to linking to the local market ads. In this manner, national ads can be used to transition viewers from general interest in a product to finding specific information about the product available locally.

The templated VOD content delivery system can also support "traffic building" videos, including music videos, that may not generate direct revenue. Once a video is encoded and registered into the system, the management and distribution of the video is conducted through software systems and automated controls. The User Interface provides the user with the ability to navigate and find desired video content. Selection of a category presents the user with a list of video titles available for playback. Categories and

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title lists can be generated using real-time database queries, allowing for database-driven management of content within the User Interface. The User Interface can also support a search interface which allows the user to search the video content database to generate a list of video titles with specific characteristics.

As another aspect of the present invention, a VOD content delivery system may be adapted to offer consumer-generated classified ads on TV. The VOD content delivery system is provided with a Content Management frontend to receive consumer input and convert it to video display ads maintained in the system database. Referring to FIG. 2A, a system for managing, converting and displaying individual consumer-generated ads on a VOD content delivery system has a Web-based Content Management System 40 for enabling an individual user to upload content from their computer via a web browser to display a consumer-generated video ad on TV. The uploaded content includes meta data for classifying the video ad by title and topical area(s). A Content Screening System 41 is used for screening the content input by the individual user, such as by performing automatic searching for objectionable text, audio, video and/or images and rejecting the content if found objectionable.

A Content Feed System 42 is used to automatically transfer consumer-generated content screened through the Content Screening System 41 to a Content Conversion System 43. This system automatically converts the consumer-generated content supplied by the Content Feed System 42 into video display format compatible with the VOD content delivery system. The converted video ad is indexed by title and classified topical areas according to the meta data supplied by the user, in accordance with the indexing system maintained by the Content Management System. The VOD Content Delivery System 44 operates a Classified Ads VOD Application in which menus for finding classified ads are navigated by viewers, and specific classified ads are delivered through the Digital Cable Television System for display as video ads on the viewer's TV equipment in response to viewer request input by remote control to the Digital Set Top Box 21, as described previously with respect to the operation of the general VOD platform.

Referring to FIG. 2B, the Web-based Content Management System 40 includes a plurality of functional components to allow consumers to create and manage their own classified ads as interactive television content, as well as pay for the distribution of their content within the digital cable television system. A Classified Management Application 50 is used to receive consumer-input content, have it screened (by the Content Screening System 41, not shown), and store it in the Classified Metadata, Image and Video Database 51. Consumer payment for running video ads is handled by the Transaction Processing Component 53. Also included in the Content Management System are an Account Management Component 55 and Account & Permissions Database 56 for management of user accounts for use of the web-based TV Classified Ads system. A Bulletin Board Ads application may be operated in parallel with the TV Classified Ads application. A Bulletin Board Management Application 54 and Database 57 enable the creation and management of consumer-generated content relating to public announcements and other items of general interest for groups, organizations or topics. The preferred VOD Content Delivery System uses templated VOD content, and a Template Library 58 is used to store templates for both the Classified Ads and Bulletin Board Ads applications.

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The Account Management Component controls the access by persons to the web-based Content Management System. The Account Management Component identifies persons accessing the system for the first time and allows these persons to register and create an account by providing an account name, password, credit card information and other information required for the payment of fees. The Account Management Component controls the access by registered users to their accounts and manages the privileges and security associated to all accounts. Persons may create accounts for the creation and management of Classified Ads. Accounts capable of accessing the Bulletin Board Management Application may also be assigned by a system administrator in the Account Management Component. Any account capable of accessing the Bulletin Board application can then create and manage bulletin board ads for the assigned bulletin boards.

The Classified Content Management System enables users to upload text, audio, video, and/or image files for classified ads in industry-standard file formats and have it converted into video display ads compatible with the VOD Content Delivery System. Classified ads are searched on the viewer's TV equipment by menus and lists indexed by title and topical areas corresponding to the metadata associated with the classified ads content. Selection of a listed item results in the display of a TV display ad containing uploaded text, images, video and/or audio. Users pay listing fees to the operator of the system for maintaining and displaying the classified ads on the digital cable television system.

Significant features of the Classified Ads Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) uploading digital images of the item to the Content Management System; (c) uploading digital video of the item to the Content Management System; (d) uploading digital audio regarding the item to the Content Management System; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided content; (j) ability to save classified content in persistent memory or storage for subsequent modification; (k) ability to mark classified content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when a classified content item is to become accessible by users of the interactive television system and the data and time when a classified content item is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that a specific content item is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created classified content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific consumer-generated content by users of the interactive television system; and (p) ability to calculate fees for classified content and submit payment of the fees using the Transaction Processing system.

As noted in (i) above, the Classified Content Management System allows the user to view the content they have composed using the templates. The templates are designed specifically for use on interactive television systems and the

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user is able to view on the web-interface their content as composed for presentation on television. As noted in (j) above, the Classified Content Management System allows the persistent storage of classified content; although the user is composing interactive television pages using a template system, the content is persistently stored as individual elements to simplify changes by the user and to allow the conversion of the content to different formats as required by different interactive television systems.

The Bulletin Board Content Management System provides the users of the web-based Content Management System with content creation and content management tools for the creation and maintenance of consumer-generated content related to announcements and other informational items of general interest. Bulletin Board content is displayed on the interactive television system as dedicated interactive television screens (bulletin boards), where approved groups, organizations or topics are each assigned a bulletin board for the display of their information. Bulletin Board content is displayed as list items organized within a bulletin board; selection of a list item results in the display of an interactive television screen containing or providing access to the descriptive data, text, images, video and audio regarding the item.

An alternative implementation of a Bulletin Board can display the content as scrolling text, where the user scrolls through the text, or the text scrolls automatically. Bulletin Board accounts will pay fees determined by the operator of the system for the distribution of the bulletin board content on the interactive television system for display on the digital cable television system. Significant features of the Bulletin Board Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) upload digital images to the content management; (c) upload digital video to the content management system; (d) upload digital audio to the content management system; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided bulletin board content; (j) ability to save bulletin board content in persistent memory or storage for subsequent modification; (k) ability to mark bulletin board content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when specific bulletin board content is to become accessible by users of the interactive television system and the data and time when specific bulletin board content is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that specific bulletin board content is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created bulletin board content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific bulletin board content by users of the interactive television system; and (p) ability to calculate fees for bulletin board content and submit payment of the fees in conjunction with the Transaction Processing component.

The Transaction Processing component allows users of the Classified Content Management System and Bulletin Board Content Management System to determine and pay

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for any fees resulting from their use of these systems. The Transaction Processing component will allow users to pay for fees using credit cards or other supported payment methods. Significant features of the Transaction Processing component include: (a) ability to maintain business rules for use by the Transaction Processing system to determine fees based on user type and content type; (b) ability to maintain business rules for one or more payment methods for use by the Transaction Processing system in handling the settlement of fees; (c) ability to maintain business rules for user account and payment settlement conditions such as delinquency and lack-of-credit for use by the Transaction Processing system in determining user account privileges and content status; and, (d) ability to process payment of fees in real-time for payment methods that support real-time settlement.

Referring to FIG. 2C, the Content Screening System (41) is comprised of a Text Screening Application 60 which searches for objectionable words or phrases, an Image Screening Application 61 which searches for objectionable graphic images, a Video Screening Application 62 which searches for objectionable images or audio words or phrases in video segments, and an Audio Screening Application 63 which searches for objectionable words or phrases in audio segments. The Content Screening System can be used for both Classified Ads content and Bulletin Board content. Content that has been screened by the Content Screening System is then transferred to the aforementioned Classified Ads Database 51 or the Bulletin Board Content Database 57. The system also has component 64 for Editorial and Customer Service Functions for Classified Ads, and component 65 similarly for Bulletin Board content. These can each include an Email Function to send confirmations of input, reasons for rejection of posting, suggested corrections, further processing, and posting of content to consumers using the system.

Significant features of the Content Screening System include: (a) ability to maintain a library of objectionable or illegal words and phrases for use in the screening of text; (b) ability to perform automated analysis of user content text using the text library as an input and alert system administration personnel to the use of objectionable or illegal content and the use of unknown and suspect words or phrases; (c) ability to maintain a library of objectionable or illegal image elements for use in the screening of images; (d) ability to perform automated image recognition analysis against user content images using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (e) ability to maintain a library of objectionable or illegal image elements for use in the screening of video; (f) ability to perform automated image recognition analysis against user content video using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (g) ability to maintain a library of objectionable or illegal audio elements for use in the screening of audio; (h) ability to perform automated audio analysis against user content audio using the library of audio elements as an input and alert system administration personnel to the use of objectionable or illegal content; and (i) ability to save screened content in persistent memory or storage for subsequent processing. Content Screening is automatically performed with the Content Management System 40 during the user process of submitting and/or creating consumer-generated content or may be performed as a process subsequent to the creation of content by the user.

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Referring to FIG. 2D, the Content Feed System 42 and the Content Conversion System 43 provide for the transfer of user content from the Content Screening System and conversion to video content format compatible with the VOD Content Delivery System 44. The Content Feed System 42 has a Content Selection/Date Filtering Application which selects consumer-generated content uploaded to the system that is within the dates contracted for posting and display of the content as Classified Ads or on Bulletin Boards. Content within the active date range is transferred to the Active Classified Ads Database 71A or the Active Bulletin Board Database 71B.

The Content Conversion System receives consumer-generated content in industry-standard formats or created in viewable format (HTML) on the web-based input system and converts the content into formats compatible with the VOD Content Delivery System and for display on viewers' televisions. The Content Conversion System 43 has an Image Conversion Application 72 which converts consumer-uploaded image files (in industry-standard formats such as JPEG, GIF, TIFF, BMP, PDF, PPT, etc.) into VOD content format, a Video Conversion Application 73 which converts consumer-uploaded video files into VOD content format, and an Audio Conversion Application 74 which converts consumer-uploaded audio files into VOD content format. Content converted to VOD content format is stored in the Active Converted Classified Ads Database 75A or the Active Converted Bulletin Board Database 75B. The content is subject to a further Production Push Function 76A, 76B and stored in the Production Classified Ads Database 77A or the Production Bulletin Board Database 77B, if any presentation formatting, date stamping, template framing, or other system editing is required by the system.

Significant features of the Content Feed System include: (a) ability to select user content for submission to the Content Conversion System through the testing of appropriate parameters including the date and time information contained in the user content; (b) ability to appropriately package the elements of the user content to permit the efficient transfer of these content elements to the Content Conversion System through an Application Program Interface or other interface; (c) ability to create, maintain and execute a schedule for when the Content Feed System will execute on an automatic basis for the automatic transfer of consumer-generated content to the Content Conversion System; and, (d) ability to execute the functions of the Content Feed System on a manual basis in the presence or absence of a schedule. The Content Feed System may be able to package and distribute content to single or multiple Content Conversion Systems.

Significant features of the Content Conversion system include: (a) ability to receive content packages delivered by the Content Feed System through an Application Program Interface or other interface; (b) ability to process the elements of consumer-generated content into data, text, graphic, video and audio elements that are compatible with the interactive television system and maintain the content presentation created by the user on the web-based Content Management System; (c) ability to save reformatted content in persistent memory or storage for subsequent distribution and use by the interactive television system; and, (d) ability to inform the interactive television system that consumer-generated content is available for distribution and use. The Content Conversion System may be added as a component system of the VOD Content Delivery System, or it may be implemented as a wholly separate system that connects to the VOD Content Delivery System through an Application

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Program Interface or other interface. When implemented as a system that is separate from the VOD Content Delivery System, it is possible to support multiple, different interactive television systems by either (a) incorporating multiple formatting requirements into a single instance of the Content Conversion System or (b) creating multiple Content Conversion Systems, each supporting the formatting requirements for a specific interactive television system. Either implementation allows for a single instance of consumer-generated content that is created and maintained using the web-based Content Management System to be distributed and displayed on multiple, different interactive television systems with different formatting requirements.

The VOD Content Delivery System **44**, as described previously, provides for the distribution of screened, converted, properly formatted consumer-generated content to viewers' televisions, typically through the use of digital set-top boxes connected to a digital cable television system capable of supporting real-time two-way data transfer between the set-top box and the Cable Head End. Significant features of the VOD Content Delivery System include: (a) ability to receive properly formatted content from the Content Conversion System; (b) ability to distribute said content over a digital cable television system and display this content on television as an interactive television presentation; (c) ability to receive user commands generated by an infrared remote control device, keyboard or other device; (d) ability to respond to the user commands by displaying appropriate content or executing desired functionality; and, (e) ability to generate and collect data regarding the user sessions and the viewing data regarding consumer-generated content on the interactive television system and make this data accessible to the Tracking System. The VOD Content Delivery System can employ templated VOD content delivery, as described previously with respect to FIG. 1A, enabling use of the Drill Down Navigation method in which viewers can navigate visually through classified ad hierarchical categories to specific titles or content.

The VOD Content Delivery System for the Classified Ads application can also employ the Tracking System **15** for the collection and consolidation of viewing data generated by the interactive television system and the generation of reports against this viewing data. For example, the Tracking System can track the number of viewer requests for viewing that a classified ad received in a given period and calculate billing charges accordingly. The Tracking System can make this information available to users of the Content Management System as well as to system administrative personnel performing general analysis of interactive television services and associated content. Significant features of the Tracking System include: (a) ability to access and process the data generated by the Classified Ads application; (b) ability to form summaries of the viewing data against desired parameters; (c) ability to save data, summaries and reports in persistent memory or storage for subsequent modification or access; (d) ability to make data, summaries and reports accessible by users of the web-based Content Management System, restricting the data accessible by any specific user to data regarding the content created by that user account on the Content Management System; and, (e) ability to make data, summaries and reports accessible by to system administration personnel.

As another aspect of the present invention, implementation of a VOD content delivery system can be made on any digital television system that supports real-time two-way data transfer and interactivity between the digital Set Top Box and application servers and VOD servers located at

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headends or other service points within the television system network. An alternative digital television system of increasing importance in the marketplace is Internet Protocol Television (IPTV). IPTV is a system for delivering video content, both broadcast and Video on Demand, to digital set top boxes and other devices. IPTV and digital cable both transmit digital video in packetized data streams within closed, proprietary broadband systems; however, IPTV uses Internet Protocol (IP) to structure, route and deliver the digital video packets within an IPTV system.

Referring to FIG. 3, an alternative implementation for a VOD content delivery system is illustrated for an IPTV system. The components of the VOD content delivery system listed in the figure are similar to those in FIG. 1A. However, FIG. 3 illustrates the terminology and network architecture of an IPTV system as used for the purposes of this invention. The VOD Application Server **10**, Content/Template Database **11**, Video Server **12** and Tracking System **15** are located in the IPTV Service Node; the IPTV Service Node is equivalent to the Cable Headend in FIG. 1A. Systems external to the IPTV Service Node such as the Application Data Center **30**, Profiling System **16**, Targeting System **17** and Video Content Distribution Network **14** connect to their associated VOD Content Delivery System components housed within the IPTV Service Node in manners similar to those used in a digital cable system implementation. IPTV systems can use multiple network technologies within their closed, proprietary broadband network. Core and Access Network **78** are high-bandwidth networks connecting IPTV Service Nodes in order to support the central transport of video streams. The Core and Access Network **78** feed the Customer Access Network **79**, which supports the physical network connection into the customer premise and connects to the IPTV Digital Set Top Box **80**. The combination of the Core and Access Network **78** and Customer Access Network **79** is the functional equivalent of the Digital Cable Television System **13** in FIG. 1A.

In operation, the VOD Content Delivery System implementation for IPTV is identical to the digital cable implementation. The VOD Application Server **10** operates a VOD application for the IPTV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer's remote control unit transmitting an IR signal to the IPTV Digital Set Top Box **80** that is sent on as IP-encapsulated message through the IPTV System to the VOD Application Server **10** at the IPTV Service Node. In response to the signal, the VOD Application Server **10** determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database **11** and video content segment from the Video Server **12**, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server **10** retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a "drill-down navigation" method to find specific end content of interest.

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Similarly, all previously mentioned adaptations of the VOD Content Delivery System implementation for digital cable, such as Classified Ads and Bulletin Boards, are supported identically on IPTV implementations.

Wide Ranging Content Uploadable Via Internet to Digital TV VOD Platform

In the foregoing description, the uploading, management, conversion, and display of content uploaded from the Internet for viewing on a VOD platform was described for an embodiment in which consumer-generated classified ads and other TV-displayable information of interest are uploaded via Internet for conversion and display as video programs on cable TV infrastructure. Even further, the principles of the invention are applicable to a wide range of other content uploadable on the Internet and to other types of digital television service providers such as DSL telephone lines, local area broadband networks, and wireless broadband networks. In the following description, another exemplary embodiment of the present invention is described with respect to uploading wide ranging content via Internet for viewing on the VOD platforms of any type of digital TV system.

Referring to FIG. 4, informational/media content from any Content Source can be uploaded via Internet to a Digital TV System for placement on its Video-on-Demand (VOD) Platform to be viewable as TV programs on Viewers' TVs by selection from an Electronic Program Guide (EPG) transmitted via the viewer's Set Top Box for display on the TV. Content is uploaded by an author or publisher to the Web-based Content Management System 40, which processes the content through a Content Feed System 42 and Content Conversion System 43 (from standard digital data formats to TV video format) to the VOD Content Delivery System 44 where it is stored in its associated Video Content Database 45 for retrieval upon viewer request. Uploaded TV programs are offered to viewers by listing them on the EPG, and upon viewer selection via the Set Top Box, are delivered via the Digital TV System infrastructure.

For VOD platforms, an EPG is typically presented to viewers as a program guide displayed on the TV for finding a title of interest associated with that particular VOD channel. The EPG display can be pulled up using the commonly used "Guide" button on remote control units, or an "EPG" button that indicates that the set-top box supports more advanced guide navigation functions. The EPG display typically starts with a top level menu offering a vertical list or horizontal bar of broad categories of content, e.g., Movies, Documentaries, TV Shows, News, Sports, Community Events, Self-Help, Infomercials, etc. For example, the viewer can cursor through categories on a horizontal bar by using the Left/Right arrow keys on the remote control unit, and select a category by placing the cursor highlight on the desired category title, such as "News", and clicking the "Select" key on the remote control unit. The EPG then brings up the next display of subcategories available in the selected category. For the "News" category, it might display subcategories of "ABC", "NBC", "CBS", "CNN", "MSNBC", "Anywhere Reports", etc. Upon selecting "Anywhere Reports", the EPG would then display the next level of subcategories down, e.g., "San Francisco", "Los Angeles", "Denver", "Dallas", "Chicago", "Boston", "New York", "D.C.", etc. This sequence continues until the viewer selects a program title or exits the EPG. In order to give the viewer a navigation experience similar to using a browser to visit pages on a website or series of websites, the EPG can be programmed to allow the viewer to cursor back to a higher category level or go forward to a lower level previ-

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ously traversed by pressing the Up/Down arrow keys. Similarly, after the viewer has viewed a selected TV program, pressing the "EPG" button again returns the viewer to the position of the title in the EPG. The EPG display can also provide visual traces or "breadcrumbs" of the categories and subcategories traversed by the viewer to that title by displaying the hierarchical addressing sequence on a top or lower border of the TV display.

The EPGs for VOD "channels" thus use program guide displays on the TV which are in a structured hierarchy to allow the viewer to navigate to a program title of interest. Upon selecting the title, a data return associated with that title is sent from the set-top box as a request to the VOD platform for the program associated with that title. The EPG database of the VOD platform maintains an index linking the program titles to the addresses in the VOD Content Database 45 where the respective programs are stored. Upon receiving a request of a program title from the set-top box, the VOD Content Delivery System 40 retrieves the corresponding video content from the Database and transmits it on its broadband network to the set-top box that sent the request. Advanced VOD platforms also have VCR or DVR-like functions that enable a viewer to Pause, Play, Rewind, Fast Forward, and Stop a program using the TV remote control unit.

Hierarchical Addressing of TV Programs

In the present invention, the EPG hierarchical display structure used in VOD platforms is used as a form of "hierarchical addressing" that uniquely allows viewer navigation to and identifies a program title of interest. This EPG hierarchical addressing scheme can be represented as a string of category term, subcategory term(s), and title that together (as a string delimited by standard character delimiters) uniquely identifying each program offered on the EPG channel. In FIG. 4, for example, the EPG address for a program title on the VOD channel might be represented with a TV (EPG) address as:

TV:/News/Anywhere Reporting/New York/Financial/"Live from NYSE by Jim Cramer"

The uploaded content may be of any digital media type and come from any web-based source. For the TV viewing environment, content accompanied by video images and voice and/or sound is preferred for presentation as entertainment or recreational viewing. Such content can be generated ubiquitously from any PC computer by an author or publisher using a video or webcam for images and a microphone for audio. The media streams may be edited and composed with a multimedia program, such as Microsoft Windows™ Media, Apple Quicktime™, Macromedia Flash™, and others. Similarly, the content may already be composed as a video program and posted on a website as a downloadable video program via a web link or publishing point address. For example, websites like YouTube.com, Brightcove.com, and others have become very popular by offering thousands of self-published video programs by nonprofessional authors and publishers for viewing on the Internet. Such video content may also be uploaded from digital media devices such as iPod™ Video sold by Apple Computer Corp. on which it has already been downloaded from a website. It may also be uploaded from digital phone devices such as iPhone™ sold by Apple which has an on-board camera for video and microphone for sound.

The term "Internet" is intended to include any wide area digital network or network of networks connecting a universe of users via a common or industry-standard (TCP/IP) protocol. Users having a connection to the Internet commonly connect browsers on their computing terminal or



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device to websites that provide informational content via web servers. The Internet can also be connected to other networks using different data handling protocols through a gateway or system interface, such as wireless gateways using the industry-standard Wireless Application Protocol (WAP) to connect Internet websites to wireless data networks. Wireless data networks are being deployed worldwide and allow users anywhere to connect to the Internet via wireless data devices.

The Digital TV System in FIG. 4 can be of any type that supports video-on-demand programming to TV viewers on any suitable type of VOD platform (infrastructure). While it may be a Cable TV system as described previously, it may be any type of digital TV system providing TV services via a high-speed data connection to the viewer's TV. For example, it may be an Internet Protocol TV (IPTV) system of the type connected to home subscribers via phone DSL lines, cable or other high-speed, high-bitrate connections. As previously described with respect to FIG. 3, the IPTV system can support video-on-demand TV services to TV viewers on a scale that cannot be supported by Internet video websites. The Internet is not an infinitely scalable resource, and placing a burden such as high-bitrate, high definition, full-screen video streams in any significant volume can overwhelm the Internet in its present form. IPTV transmits video programs in digital format using the IP protocol, but instead of transmitting over common Internet connections, it transmits over high-speed, high-bitrate connections that are envisioned to be implemented ultimately as all-fiber optical "last mile" connection to the home.

In the present invention, content can be uploaded via the Internet to the Web-based Content Management System 40 of a Digital TV System and automatically converted, navigated and selected/displayed on the VOD platform for viewing on home TV. Automatic navigation, selection and display is enabled by adopting the same EPG hierarchical addressing scheme used for the VOD program guide as the addressing metadata identifying content uploaded on the Internet. When an author or publisher connects to the Web-based Content Management System 40, the author or publisher selects the category term, subcategory term(s) and title by which it is desired to find the program title in the TV EPG display hierarchy. Thus, when the above-mentioned example of a video program is uploaded, the hierarchical address for that program would be selected as:

TV/News/Anywhere Reporting/New York/Financial/"Live from NYSE by Jim Cramer".

This hierarchical addressing metadata is associated with or tagged to the content when uploaded to the Web-based Content Management System 40, and is carried over into the VOD/EPG navigation scheme displayed on the TV. Hierarchical addressing is already well familiar to computer users through the hierarchical ordering of files stored in layers of folders on computers. By carrying over the hierarchical address metadata into EPG navigation, the invention allows the content to be automatically listed in the EPG under a common addressing scheme to enable viewers to find any program of interest. The hierarchical addressing string of terms also resembles URL addressing sequences commonly used on the Internet. Thus, Internet users can readily become familiar with finding TV programs on the VOD EPG guide due to its resemblance to finding web resources with a URL. Indeed, in the convergence of Internet and TV worlds, a TV EPG hierarchical address may be thought of as a URL for a TV program.

The uploaded content is converted, as previously described, into a standard TV digital format, and a "local

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instance" thereof is stored at an assigned VID address in the Video Content Database 45 of the VOD platform. The VID address is linked to the metadata title for the video content listed in the EPG. The hierarchical address for the title is automatically carried over into the EPG navigation scheme, and can be found by a viewer cursoring (with the TV remote control) through the EPG following the same hierarchical addressing sequence. Upon the subscriber selecting, via a remote control unit in communication with the set-top box, the title of the video content from the hierarchically-arranged categories and subcategories in the EPG, a return request for the selected title is transmitted to the VOD platform for retrieving the video content at the linked VID address in the Video Content Database. The requested video program is then retrieved and transmitted by the VOD Content Delivery System 44 through the digital TV lines to the subscriber's set-top box for display on the subscriber's TV.

By the method of the present invention, the title and hierarchical address assigned by the publisher of the program is automatically carried over into the TV electronic program guide (EPG) following the same hierarchical addressing indicated by the publisher of the content. The publisher selects categories and subcategories for categorizing the title of the video content from the EPG categorization scheme presented by the digital television service provider for the listing of titles on one of its VOD channels. With this method, vast numbers of content publishers anywhere on the Internet can upload their programs with a minimum of conversion and handling steps by the digital television service provider. Home TV viewers can then easily use the EPG hierarchical navigation scheme to find something of interest for viewing.

As more and more video content becomes offered on VOD platforms of digital TV systems, it may be desirable to enable more robust functionality for the EPG including the capability to bookmark TV programs and share TV bookmarks with other TV subscribers or even friends and contacts on the Internet. Bookmarking can be implemented by using the hierarchical address as the unique address for identifying an item of interest on the VOD platform. Such a system is disclosed in a concurrent continuation-in-part U.S. patent application Ser. No. 11/685,188 by the same inventor, filed on Mar. 12, 2007, entitled "Converting, Navigating and Displaying Video Content Uploaded from the Internet to a Digital TV Video-on-Demand Platform", which is incorporated herein by reference.

The extension of TV VOD programming to citizen publishing, and the convergence of Internet searching with sharing of TV program bookmarks, can also stimulate diverse new content publishing sources and supporting hardware and equipment in the converged Internet-TV universe. For example, TV EPGs can be exported via Internet to Internet-connected digital devices, including digital phones, media players, game consoles, Video iPods™, PDAs, etc., and conversely, TV bookmarks selected from EPGs on the Internet can be imported back into the viewer's "MyEPG" or "MyVideoLibrary" for their TV through the Web-based Content Management System. This would enable people to freely select, save, bookmark, and share TV programs with friends and contacts between their TV viewing environment and their daily mobile or away-from-home environments. Internet-connected DVRs, such as those sold by TiVo, or virtual DVRs offered by the digital TV service provider can also connect Internet searching and bookmark sharing to the viewer's "MyEPG" or "MyVideoLibrary" for VOD program viewing.



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Going from Internet to the TV, a PC user can share TV bookmarks received by email on the PC with other contacts and friends whose email addresses are maintained in an address book or contact list on that person's email client. The PC user can also send TV bookmarks found in searching a website for program listings offered by the Digital TV System to their own Viewer Bookmarks filed(s) or to those of other TV subscribers. The PC user simply logs on via Internet to the Web-based Content Management Server **40** for the Digital TV System and selects an option to send the TV bookmark(s) to the Viewer's Bookmark file(s) for that person's subscriber name/user, or to the name/user of any other TV subscriber.

#### Dynamic Adjustment of EPG Displays for Faster Viewer Navigation

As more and more video content becomes offered on VOD platforms of digital TV systems, it would be desirable to dynamically adjust the EPG displays listing the categories, subcategories, and titles of TV programs in a manner to minimize the number of keypresses on the remote control unit needed to navigate to a program title of interest. In the present invention, the viewer's past history of EPG navigation and TV program selection are tracked, and the ordering of categories, subcategories and/or titles displayed in the EPG is dynamically reordered in accordance with higher relevance to the viewer. In the following description, a preferred implementation of dynamic adjustment of the EPG tracks the frequency of the viewer's selection of categories, subcategories, and titles, and reorders them in the viewer's EPG (MyEPG) for faster navigation is described.

Referring to FIG. 5, a diagram illustrates in Step **501** a typical display of an EPG for a VOD channel. The top level display of the EPG has a vertical listing (or horizontal bar) showing the names of broad categories for the TV programs offered for viewing on demand. In this example, the vertical listing lists: "Movies"; "Documentaries", "Short Subjects", "News", "Sports", "Public Interest", and "Infomercials" in top to bottom order. In this embodiment, a button for "MyEPG" is also offered to link the viewer to a viewer-individualized EPG.

Upon pressing the "MyEPG" button in Step **501**, the viewer is taken to Step **502** in which the first LogIn display shows a list of previously registered viewers in the household subscribed to the digital TV service. For example, in this household, two viewers "Diaz-Perez, A" and "Diaz-Perez, M" were previously registered. If the viewer selects one of the previously registered names, the display also prompts the viewer for entry of their selected personal identification number (PIN). If the current viewer wishes to register as a new viewer in the household, the LogIn display offers the option of entering a new viewer name and PIN using the remote control unit for character spelling (numeric pad style). Upon selecting or entering the viewer name and PIN, the viewer then presses the button for "Go To MyEPG".

The viewer is then taken to Step **503**, where the top level display of MyEPG shows a vertical listing of names of the broad categories for the TV programs offered for viewing on demand. However, in this example, the vertical listing has been reordered to list from top to bottom those categories in order of frequency with which the viewer has clicked on them in the past, e.g., "Public Interest", "Documentaries", "Short Subjects", "Sports", "News", "Movies", and "Infomercials". Therefore, this viewer who has previously visited the "Public Interest" category most frequently now only needs to click the "Select" button to link to the next level of MyEPG display. The viewer who has previously visited the

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"Documentaries" category second most frequently only needs to cursor down (arrow key) one click to highlight the "Documentaries" category then press the "Select" button, and so on. In a similar manner, subcategories listed on the next level of MyEPG display are reordered in order of frequency of this individual viewer's past navigation clicks, and so on to lower subcategories and finally to individual titles of TV programs.

If the VOD channel has too numerous category names or titles to list on any given MyEPG display level, it can also reorder the display by listing, say, the top 7 category names or titles as a suitable number of displayed choices, and all other category names or titles of lower relevance out-of-sight on a following page accessed by clicking the "More" button.

In this manner navigating through many options at each level of EPG display can be made faster for the individual viewer in MyEPG. Once the viewer identifies him/herself to the VOD system by logging in to MyEPG, the system tracks all EPG navigation clicks as being those of that viewer until the TV session ends or another viewer in the same household logs in. As a basic tracking method, the system tracks which categories and subcategories the viewer clicks on most frequently, then reorders the EPG nav listing/bar to display those listed first.

As a preferred form of implementation of MyEPG reordering, the system can employ the hierarchical, templated approach to "drill down" navigation to VOD items of interest as previously described with respect to advertising in FIGS. 1B and 1C. To illustrate, in FIG. 6, the drill-down navigation in MyEPG can proceed from a top category level display in **601**, to selection of a next subcategory level display **602**, to selection of a further subcategory level display **603**, and finally the titles display **604**, all of which have the category and subcategory names and titles reordered in highest priority for those most frequently clicked by the viewer. Instead of cursoring through the list, the options may also be listed indexed to numbers which can be selected by one keypress of the corresponding number on the remote control unit.

Referring to FIG. 7A, an overall system architecture for a MyEPG system includes the MyEPG Server **702** located at or connected to a digital television system Head End. The MyEPG Server **702** processes any requests from the viewer for MyEPG information to be displayed within the MyEPG display templates. In the first illustration in FIG. 7A, the viewer has logged into the MyEPG system, and the MyEPG application needs the proper content categories to populate the MyEPG Main Menu **701**. A request for this information is sent to the MyEPG Server **702** upon performing the login. To process the request, the MyEPG Server **702** receives information regarding the viewer from the User Profile database **704**. The User Profile information can include programming preferences stated by the viewer, demographic information (such as age, gender, income, geographic region, etc.) and other descriptive information that may be useful to the relevance algorithms of the MyEPG Server **702**. The MyEPG Server **702** also obtains information regarding the actual viewing habits of the viewer from the Usage History database **703**. The Usage History database **703** is updated whenever the viewer accesses programming content, providing a detailed log of the viewer's consumption of programming content. The MyEPG Server **702** uses the information from Usage History **703** and User Profile **704** to form a relevance schema by which to rank and order the programming data provided by the EPG Data/Metadata database **705**. This newly reordered EPG data is packaged

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into a MyEPG Query Result Set **706** and delivered to the MyEPG application for display to the viewer, using the MyEPG templates. In the MyEPG Main Menu **701**, the viewer is presented with a list of categories in order of relevance to the viewer as determined by their viewing habits.

Continuing in FIG. 7A, the viewer has reviewed the programming categories displayed in the MyEPG Main Menu **701** and selects the category "SPORTS". Upon selecting "SPORTS", the Usage History database **703** is updated to reflect this MyEPG selection by the viewer. Similar to the processing for the MyEPG Main Menu **701**, a request is generated to the MyEPG Server **702** for a listing of the programming subcategories for "SPORTS". Using the information from the Usage History database **703** and the User Profile **704**, the MyEPG Server **702** selects and sorts the subcategories for the Sports category, packages this newly ordered EPG data in the MyEPG Query Result Set **706** and delivers it to the MyEPG application for display as the MyEPG Sports Category Menu **707**.

Continuing in FIG. 7B, after reviewing the programming subcategories displayed in the MyEPG Sports Menu **707**, the viewer continues traversing the hierarchy of the MyEPG data and selects the subcategory "HORSE RACING". Upon selecting "HORSE RACING", the Usage History database **703** is updated to reflect this MyEPG selection by the viewer. Similar to the process described in FIG. 7A, a request is generated to the MyEPG Server **702** for a listing of the programming sub-sub-categories for "HORSE RACING". Using the information from the Usage History database **703** and the User Profile **704**, the MyEPG Server **702** selects and sorts the sub-sub-categories for the Horseracing subcategory, packages this newly ordered EPG data in the MyEPG Query Result Set **706** and delivers it to the MyEPG application for display as the Horseracing subcategory **708**.

Continuing in FIG. 7B, after reviewing the programming sub-sub-categories displayed in the MyEPG Horseracing Menu **708**, the viewer continues traversing the hierarchy of the MyEPG data and selects the sub-sub-category "GOLDEN GATE FIELDS". Upon selecting "GOLDEN GATE FIELDS", the Usage History database **703** is updated to reflect this MyEPG selection by the viewer. Similarly to the process described for FIG. 7A and FIG. 7B, a request is generated to the MyEPG Server **702** for a listing of the program titles for "GOLDEN GATE FIELDS" sub-subcategory. Using the information from the Usage History database **703** and the User Profile **704**, the MyEPG Server **702** selects and sorts the program titles for the Golden Gate Fields sub-subcategory, packages this newly ordered EPG data in the MyEPG Query Result Set **706** and delivers it to the MyEPG application for display as the MyEPG Golden Gate Fields sub-sub-category **709**.

To arrive at the MyEPG Golden Gate Fields Menu **709**, the viewer has traversed four levels of hierarchy within the MyEPG system, using a single processing system to handle the queries and responses required by the MyEPG application as the viewer navigates through the MyEPG templates. The hierarchical, templated nature of the MyEPG system supports this uniform methodology for handling any number of levels in content hierarchy.

Continuing in FIG. 7C, after reviewing the program titles displayed in the MyEPG Golden Gate Fields Menu **709**, the viewer returns to the MyEPG Main Menu by selecting the "MyEPG" button on the display. Upon selecting "MyEPG", the Usage History database **703** is updated to reflect this selection by the viewer. Similarly to the process described in FIG. 7A, a request is generated to the MyEPG Server **702** for

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a listing of the Main Menu categories. Using the information from the Usage History database **703** and the User Profile **704**, the MyEPG Server **702** selects and sorts the Main Menu categories, packages this newly ordered EPG data in the MyEPG Query Result Set **706** and delivers it to the MyEPG application for display as the MyEPG Main Menu **710**. The MyEPG Main Menu **710** differs from the MyEPG Main Menu **701** in shown in FIG. 7A as a result of new usage information that affects the determination of relevance. The viewer's activity now indicates that the SPORTS category is now the mostly frequently accessed category and generates the most selections of actual programming content. In FIG. 7A, the MyEPG Main Menu **701** had "NEWS" as the first-ranked category; in the FIG. 7C, the MyEPG Server **702** has determined that "SPORTS" is the top-ranked category, and has reordered the MyEPG Main Menu listings accordingly. Similarly, if the viewer selects "SPORTS", the Sports subpage will display "HORSE RACING" at the top of the MyEPG listing, and "GOLDEN GATE FIELDS" at the top of the Horseracing subpage. However, the Golden Gate Fields subpage will list the then current days' races because those titles will have changed with current race video content uploading. To conclude the MyEPG session, the viewer selects "EXIT MyEPG" from the MyEPG Main Menu **710** and exits the MyEPG application.

As an extension to the MyEPG reordering process, the system can also employ viewer preference algorithms and determine a likely reordering of the category names and titles based on more sophisticated criteria, such as time-of-day, weekday or weekend, or even preferences based on past selections of TV program titles. For example, if the viewer frequently views episodes of the TV show "Columbo", the system can reorder titles displayed at the TV program selection level to list any newly available "Columbo" episodes at the top of the MyEPG display, or if very frequently watched, it can automatically create a category or subcategory as the next higher navigation level to list all the available "Columbo" titles.

Referring to FIG. 8A, the creation by the MyEPG system of a new category based on past selections of TV program titles is illustrated. When the MyEPG system detects a usage pattern that could warrant the creation of a new category, the MyEPG system informs the viewer of the recommendation. The MyEPG Main Menu **801** displays the "NEW CATEGORY SUGGESTIONS" menu item. When the viewer selects the "NEW CATEGORY SUGGESTIONS" menu item, they are taken to the MyEPG New Category Suggestions menu **802**. This menu lists the content categories that the MyEPG system has determined could further individualize the viewer's MyEPG display and simplify the viewer's ability to access content of significant interest. In this example, the MyEPG New Category Suggestions menu **802** lists the television series "Columbo" as a new category recommendation based on viewing habits. Continuing to FIG. 8B, the viewer selects "Columbo" and is taken to the MyEPG New Category Confirmation menu **803**. This menu allows the viewer to accept or reject the new category recommendation. By accepting the recommendation, the MyEPG system will insert the new category in the appropriate location within the viewer's MyEPG display, as determined by relevance and hierarchy. The MyEPG Main Menu **804** shows the Main Menu with the new "COLUMBO" category, ranked second in terms of relevance to the viewer. Accessing the "COLUMBO" category would take the viewer to a listing of "Columbo" episodes that are available for viewing.

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As the viewer navigation traverses through the hierarchically-arranged categories and subcategories down to individual titles for individual items of video content, the hierarchical arrangement of categories and subcategories is indicative of a unique hierarchical address for the item of video content. As previously described with respect to FIG. 4, the hierarchical address may be represented as a string of category and subcategory terms and the title delimited by standard delimiters, and used to implement a bookmarking function by which viewers can share TV bookmarks with other TV subscribers or even friends and contacts on the Internet.

The reordering of frequently selected options can also be applied to any VOD navigation schema where the viewer's experience could be enhanced by reordering the presentation layer data within the hierarchical model to suit the preferences of the viewer. For example, dynamic reordering could be applied to a navigation tree for on-demand TV programs for a specific product area of interest, such as "Autos", to order the listed product infomercials or ad information displays based on the viewer's past history of preferences.

It is understood that many modifications and variations may be devised given the above description of the principles of the invention. It is intended that all such modifications and variations be considered as within the spirit and scope of this invention, as defined in the following claims.

What is claimed is:

1. A method for dynamic adjustment of an individualized electronic program guide where the adjustment is based at least in part on individual viewer consumption of video-on-demand programs on a subscriber TV system to enable navigating by an individual viewer in a TV subscriber household that may have a plurality of viewers to video-on-demand programs offered on a video-on-demand platform of a digital TV services provider which is at least part of a digital TV services provider system, the method comprising:

- (a) maintaining, at the digital TV services provider system, an electronic program guide database comprising electronic program guide data, and a usage history database comprising a log of selection data corresponding to the viewer's consumption of the video-on-demand programs using the video-on-demand platform;
- (b) establishing, at the digital TV services provider system, viewer-individualized electronic program guide data for each of a plurality of individual viewers to enable the generation of viewer-individualized electronic program guides for each of said plurality of individual viewers at the subscriber TV system for use in accessing the video-on-demand programs, and allowing each respective individual viewer to access a display of their respective viewer-individualized electronic program guide through a Log-In step by which the respective individual viewer operating the subscriber TV system can be associated with their respective viewer-individualized electronic program guide;
- (c) in one or more previous sessions while said respective individual viewer is logged onto their respective viewer-individualized electronic program guide in order to access the video-on-demand programs on the subscriber TV system, tracking, at the digital TV services provider system, said respective individual viewer's consumption of the video-on-demand programs listed in their respective viewer-individualized electronic program guide and saving the selection data in the usage history database;

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(d) determining, at the digital TV services provider system, an order of relevance of a plurality of category names for said respective individual viewer selection of video-on-demand programs from their respective viewer-individualized electronic program guide based at least in part on said respective individual viewer's selection data from said one or more previous sessions as stored in the usage history database and reflecting said respective individual viewer's preferences for selection of video-on-demand programs from their respective viewer-individualized electronic program guide, and based at least in part on the electronic program guide data in the electronic program guide database; and

(e) at the start of each new session when said respective individual viewer logs onto their respective viewer-individualized electronic program guide in order to access video-on-demand programs on the subscriber TV system, reordering a current display listing of the category names for categories of video-on-demand programs on said respective individual viewer's viewer-individualized electronic program guide based at least in part on said determined order of relevance.

2. The method of claim 1, wherein said determined order of relevance is based at least in part on said respective individual viewer's selection data from said one or more previous sessions comprises a category-based order of relevance based on category name selection.

3. The method of claim 1, wherein said determined order of relevance is determined based at least in part on a parameter of viewer selection from the group consisting of: time-of-day, weekday or weekend, and preference indicated by past selections of program titles.

4. The method of claim 1, wherein the current display listing of category names is reordered by listing a predetermined number of category names of higher relevance on the display listing, and maintaining all other category names of lower relevance out-of-sight on a following display.

5. The method of claim 4, wherein the other category names of lower relevance are accessed by activating a "More" button on the display listing.

6. The method of claim 1, wherein video content offered for viewing on the video-on-demand platform is accessed by navigation through hierarchically-arranged categories and subcategories down to individual titles for individual items of the video content.

7. The method of claim 6, wherein the hierarchical arrangement of categories and subcategories down to a respective individual title for a respective individual item of the video content is indicative of a unique hierarchical address for the respective individual item of the video content.

8. The method of claim 7, wherein the unique hierarchical address comprises a string of category and subcategory terms and the respective individual title delimited by standard delimiters.

9. The method of claim 1, wherein the reordering of category names is provided upon transition of said respective individual viewer from a generalized electronic program guide for all viewers on the video-on-demand platform, which is generated based upon the electronic program guide data in the electronic program guide database, to a viewer-individualized electronic program guide.

10. The method of claim 1, wherein the Log-In step enables said respective individual viewer to register their name, and in a subsequent Log-In step said respective

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individual viewer only needs to select their name from a list of previously registered viewers.

11. The method of claim 9, wherein a top level display of the viewer-individualized electronic program guide displays a reordered listing of category names of top level categories for the TV programs offered for viewing on demand.

12. The method of claim 11, wherein each subsequent level display of the viewer-individualized electronic program guide displays a reordered listing of subcategory names of subcategories for the video-on-demand programs offered for viewing on demand.

13. The method of claim 9, wherein, upon access by said respective individual viewer to the viewer-individualized electronic program guide, the categories and subcategories on which the respective individual viewer clicks are tracked until the respective individual viewer logs off or the TV viewing session is ended, and the tracking of said respective individual viewer's clicks is added to said respective individual viewer's past history.

14. The method of claim 9, wherein upon access by said respective individual viewer to the viewer-individualized electronic program guide, the categories and subcategories for video content on which the individual viewer clicks are tracked and used to create automatically a new category for TV programs of the type most frequently clicked on by said respective individual viewer.

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15. The method of claim 1, further comprising automatically generating an additional category or subcategory based on the log of said respective individual viewer's consumption of the video-on-demand programs maintained in the usage history database.

16. The method of claim 1, further comprising providing said individual viewer with a recommendation for one or more additional categories to be added to the viewer-individualized electronic program guide based on the log of the respective individual viewer's consumption of the video-on-demand programs.

17. The method of claim 1, further comprising maintaining a user profile database in addition to the usage history database and the electronic program guide database, wherein the step of determining, at the digital TV services provider system, an order of relevance of the category names for said respective individual viewer selection of video-on-demand programs from their respective viewer-individualized electronic program guide is further based at least in part on said individual viewer's user profile maintained in the user profile database.

18. The method of claim 17, wherein the user profile database comprises at least one of programming preferences stated by said respective individual viewer or demographic information for said respective individual viewer.

\* \* \* \* \*

(12) **United States Patent**  
**Perez**

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(54) **VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICES SUBSCRIBERS**

(58) **Field of Classification Search**  
USPC ..... 725/74-104  
See application file for complete search history.

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

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(60) Continuation of application No. 14/978,953, filed on Dec. 22, 2015, now Pat. No. 9,491,511, which is a (Continued)

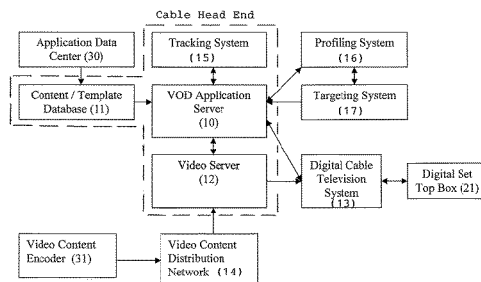
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CPC . **H04N 21/47202** (2013.01); **H04N 21/26225** (2013.01); **H04N 21/42204** (2013.01);  
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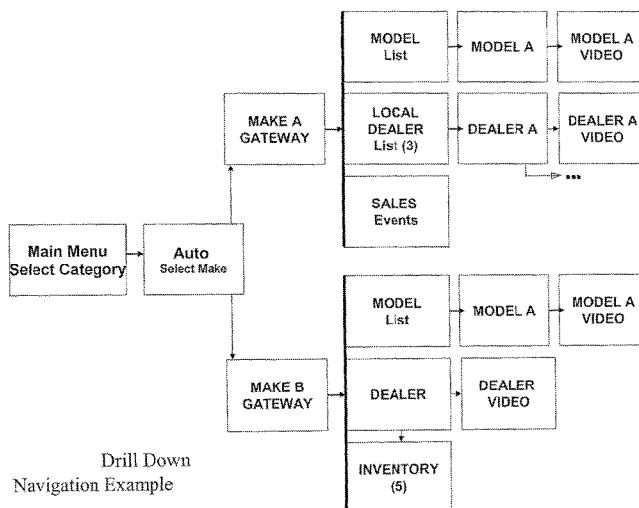
(57) **ABSTRACT**

A video-on-demand (VOD) content delivery system has a VOD Application Server which manages a database of templates for presentation of video content elements of different selected types categorized in hierarchical order. A web-based Content Management System receives content uploaded online in file formats with metadata for title and topical area, and automatically converts it into video data format compatible with the VOD content delivery system indexed by title and topical area. A User Interface for the system delivers listings data to the viewer's TV indexed by title and topical area specified by the uploaded metadata.

**19 Claims, 7 Drawing Sheets**



VOD Content Delivery System, Overall Architecture



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## Related U.S. Application Data

continuation of application No. 14/706,721, filed on May 7, 2015, now Pat. No. 9,338,511, which is a continuation of application No. 12/852,663, filed on Aug. 9, 2010, now Pat. No. 9,078,016, which is a division of application No. 11/952,552, filed on Dec. 7, 2007, now Pat. No. 7,774,819, which is a division of application No. 10/909,192, filed on Jul. 30, 2004, now Pat. No. 7,590,997.

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**21/84** (2013.01)

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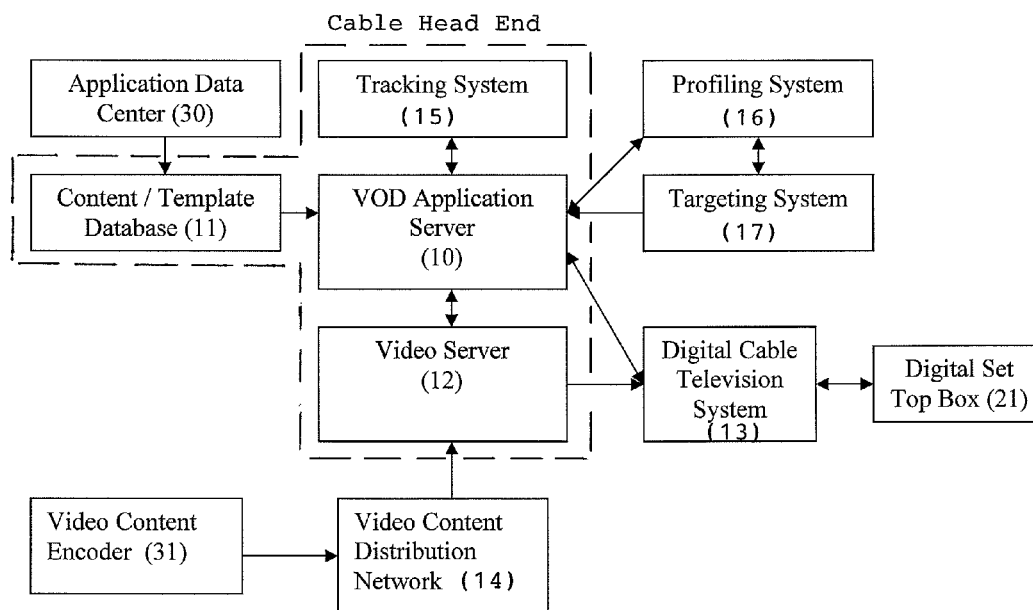


Figure 1A: VOD Content Delivery System, Overall Architecture

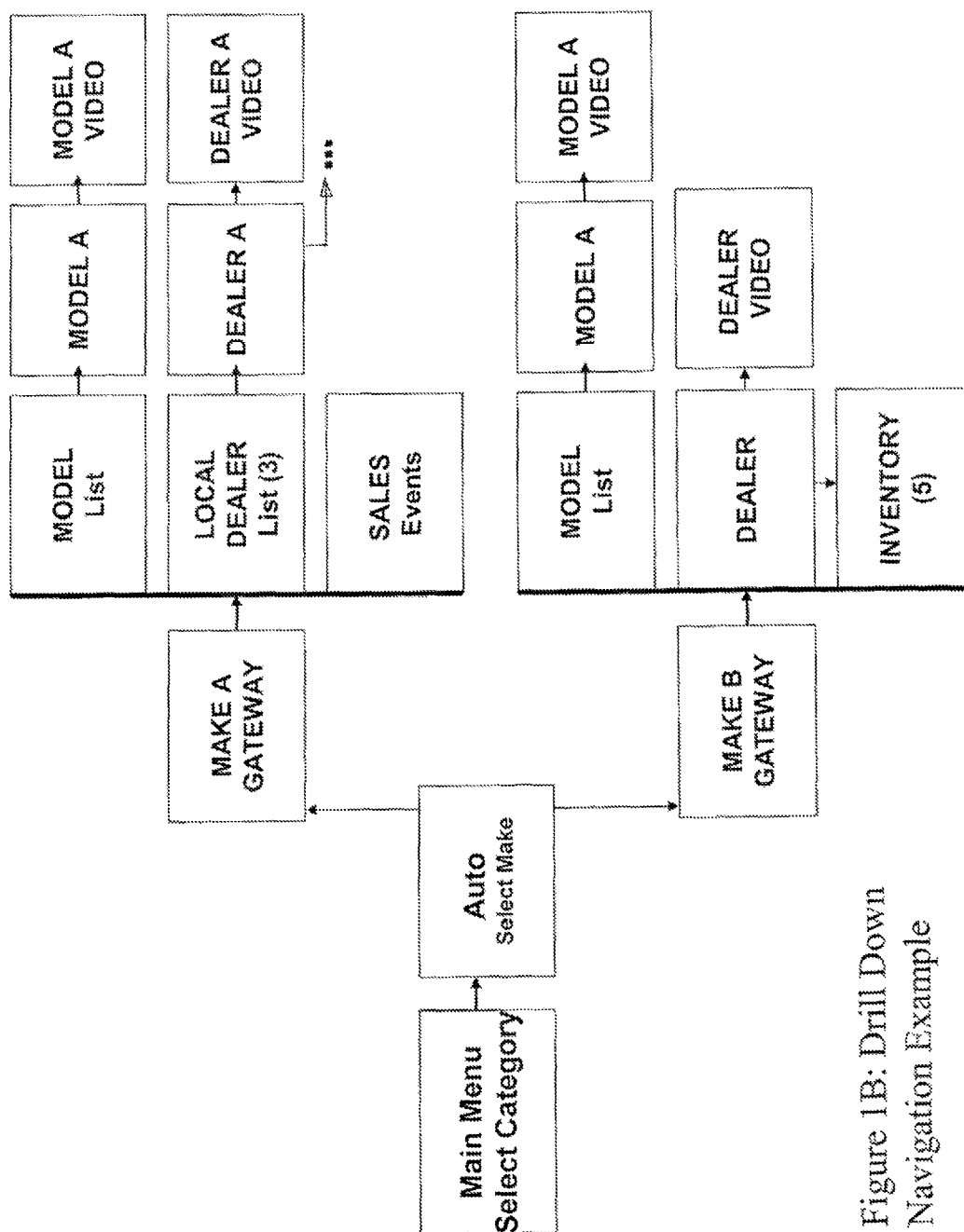
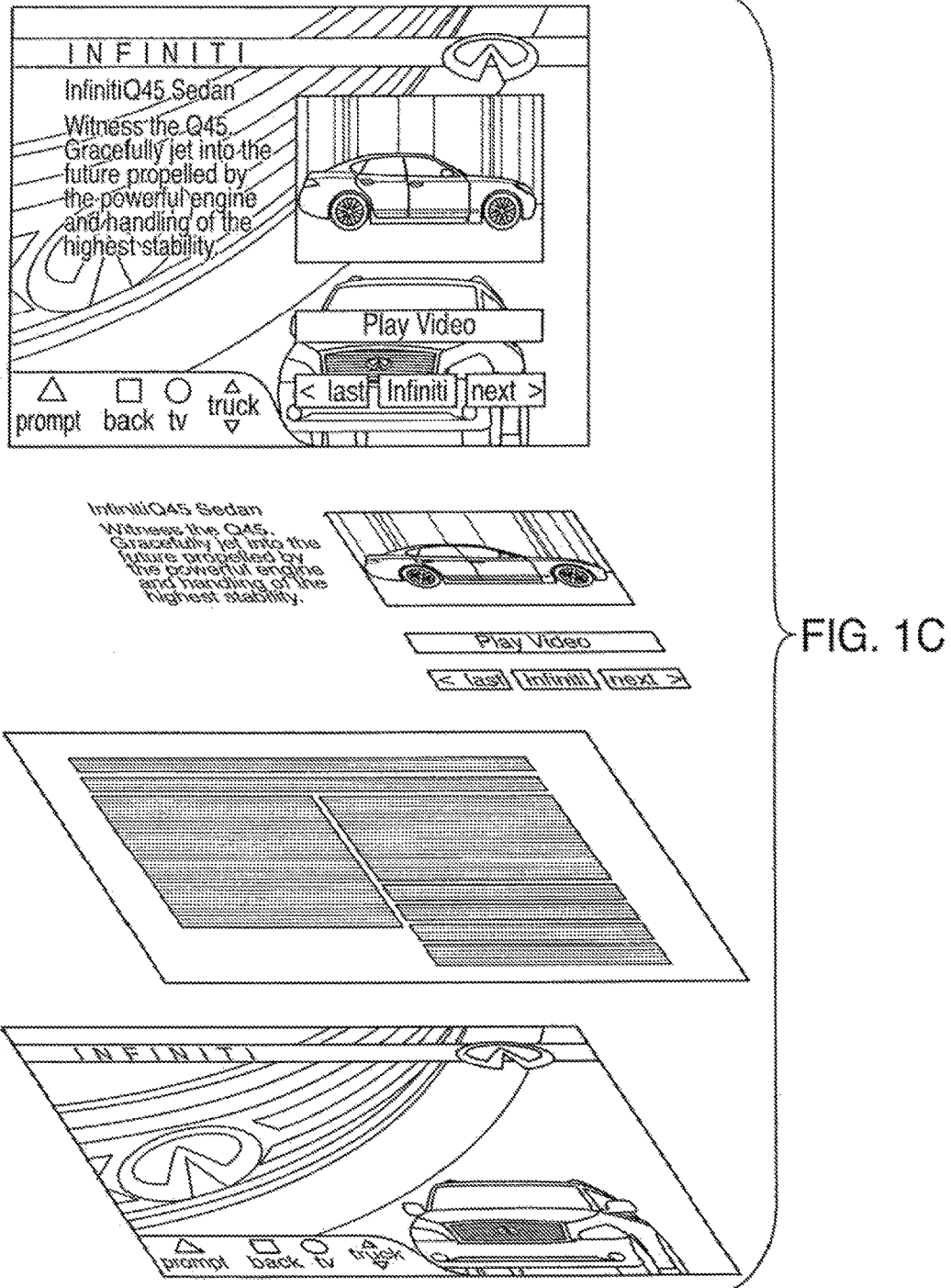


Figure 1B: Drill Down  
Navigation Example



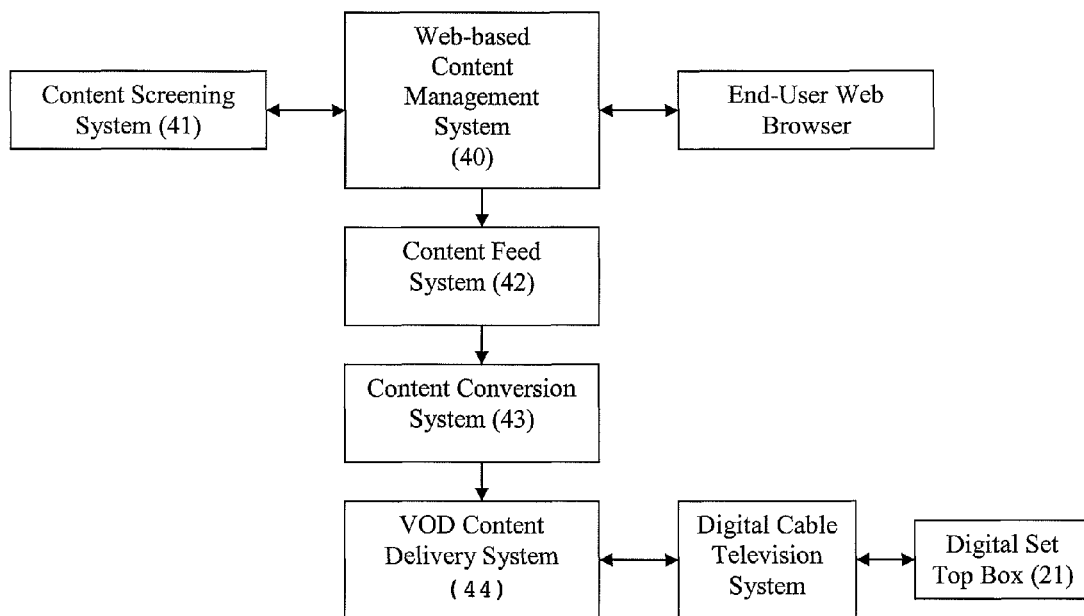


Figure 2A: Classified Ad System, Overall Architecture

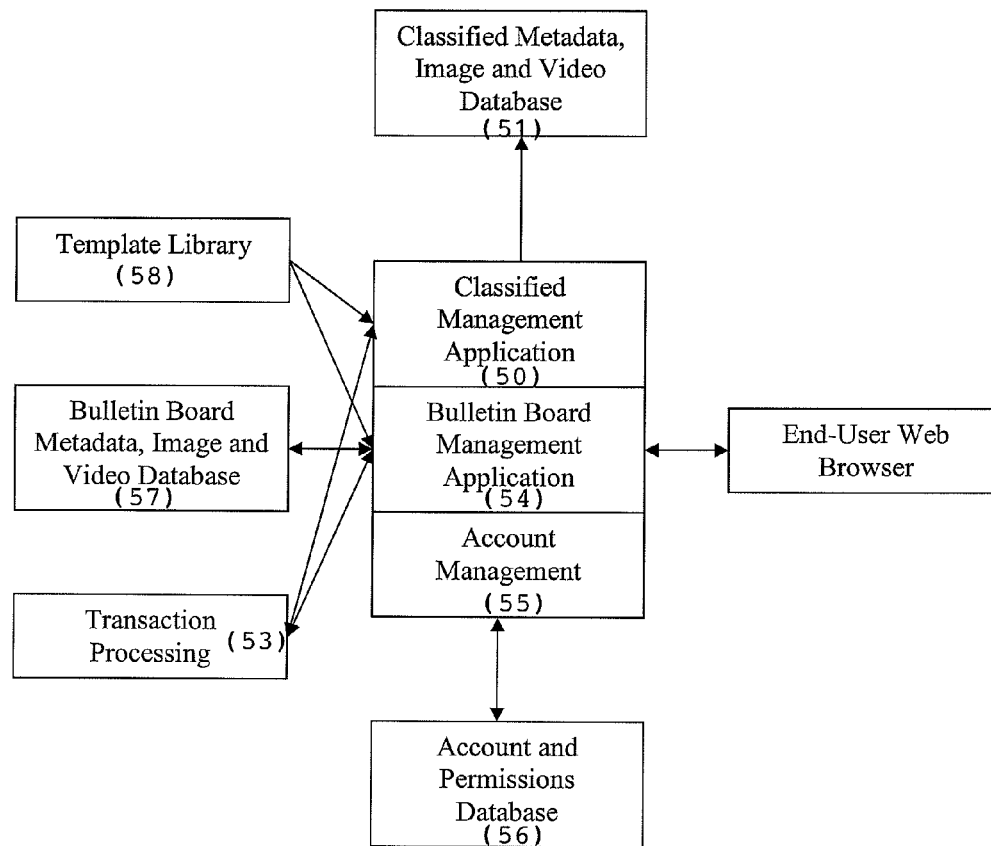


Figure 2B: Web-based Content Management System

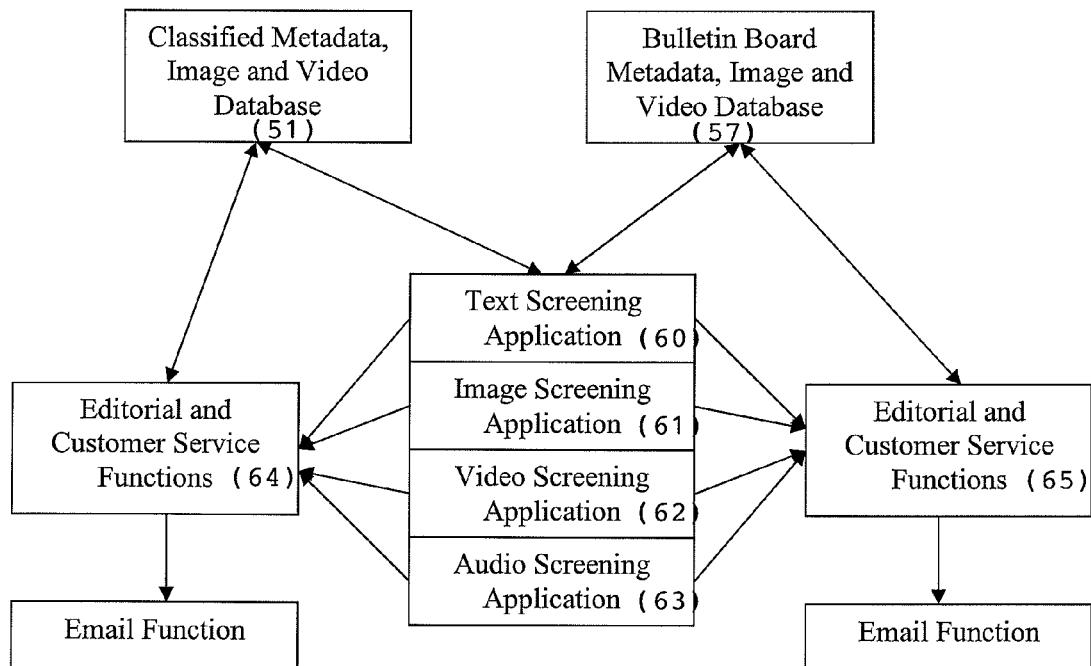


Figure 2C: Content Screening System

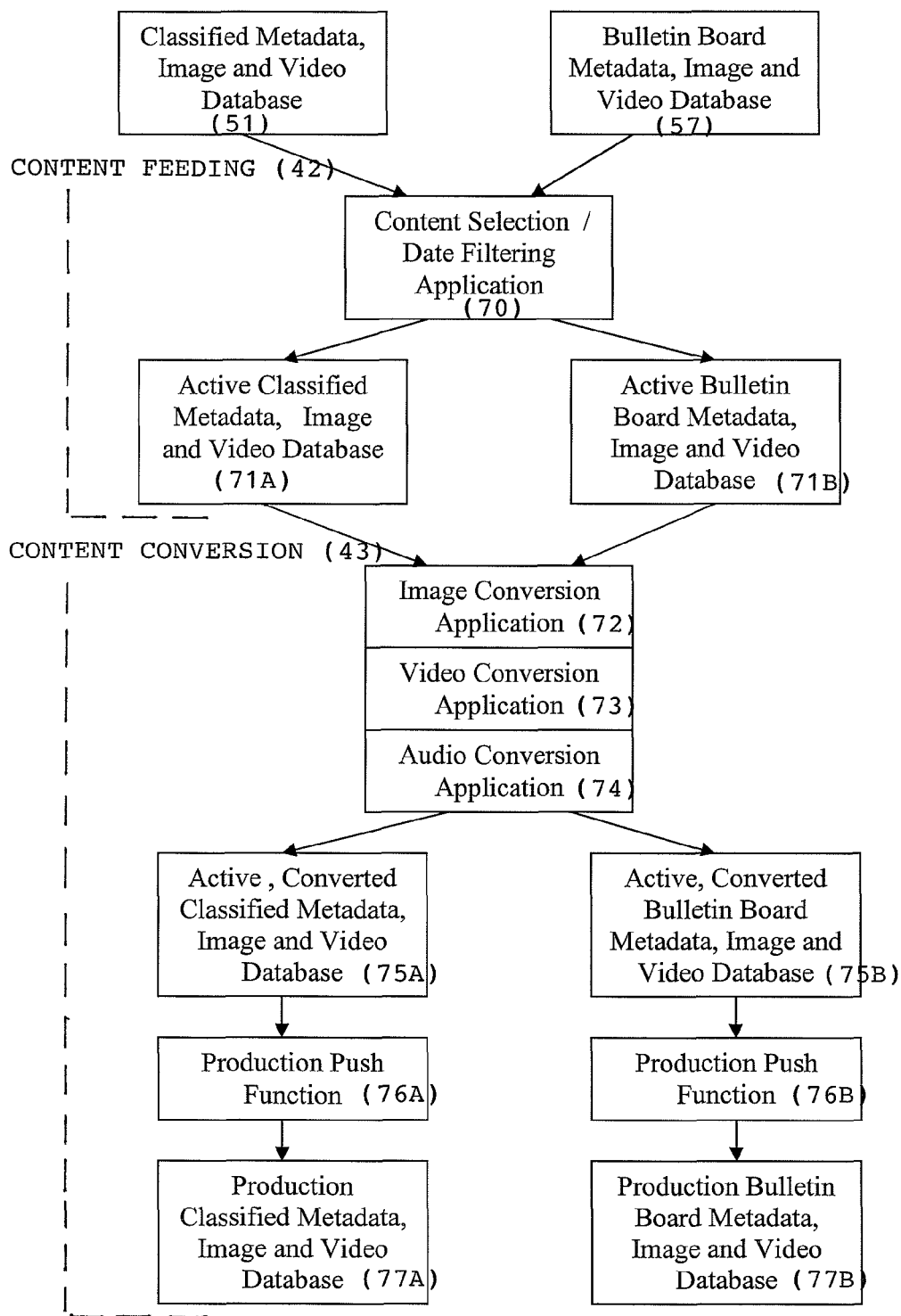


Figure 2D: Content Feed and Conversion System



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# VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICES SUBSCRIBERS

## CROSS-REFERENCE TO RELATED APPLICATIONS

This U.S. Patent Application is a continuation application and claims the benefit of copending U.S. patent application Ser. No. 14/978,953, filed on Dec. 22, 2015, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY METHOD FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", which is a continuation of U.S. patent application Ser. No. 14/706,721, filed on May 7, 2015, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY METHOD FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,338,511 on May 10, 2016, which is a continuation application of U.S. patent application Ser. No. 12/852,663, filed on Aug. 9, 2010, of the same inventor and entitled "SYSTEM FOR ADDING OR UPDATING VIDEO CONTENT FROM INTERNET SOURCES TO EXISTING VIDEO-ON-DEMAND APPLICATION OF A DIGITAL TV SERVICES PROVIDER SYSTEM", issued as U.S. Pat. No. 9,078,016 on Jul. 7, 2015, which is a divisional application of U.S. patent application Ser. No. 11/952,552, filed on Dec. 7, 2007, of the same inventor and entitled "SYSTEM FOR MANAGING, CONVERTING, AND TRANSMITTING VIDEO CONTENT FOR UPLOADING ONLINE TO A DIGITAL TV SERVICES PROVIDER SYSTEM", issued as U.S. Pat. No. 7,774,819 on Aug. 10, 2010, which is a divisional application of U.S. patent application Ser. No. 10/909,192, filed on Jul. 30, 2004, of the same inventor and entitled "SYSTEM AND METHOD FOR MANAGING, CONVERTING AND DISPLAYING VIDEO CONTENT ON A VIDEO-ON-DEMAND PLATFORM, INCLUDING ADS USED FOR DRILL-DOWN NAVIGATION AND CONSUMER-GENERATED CLASSIFIED ADS", issued as U.S. Pat. No. 7,590,997 on Sep. 15, 2009, each of which is hereby incorporated by reference as if fully set forth herein.

## TECHNICAL FIELD

This invention generally relates to the provision of interactive television services through cable TV infrastructure, and more particularly, to a system and method for managing, converting and displaying video content on a video-on-demand platform, and particularly, advertising displays used for drill-down navigation and displays of consumer-generated classified ads on TV.

## BACKGROUND OF INVENTION

Cable television (CATV) systems are used to deliver television services to a vast majority of TV-viewing homes in the U.S. and other technologically advanced countries. The typical CATV system has a cable service provider head end equipped with video servers to transmit CATV program signals through distribution lines to local nodes and from there to TV subscriber homes. Within the subscriber homes, the CATV program signals are transmitted to one or more customer-premises TV s which are coupled to external set-top boxes for channel tuning or are equipped with internal cable channel tuners.

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Current CATV set-top boxes provide various functions for channel switching and program access between subscribers and the CATV head end. The more advanced digital set-top boxes are individually addressable from the CATV head end, and also allow subscribers to input via remote control units their selection inputs for transmission on a back channel of the connecting cable to the CATV head end, thereby enabling subscribers to access interactive television services and other types of advanced digital TV services. A primary type of interactive television system is referred to generally as a "video-on-demand" (VOD) system, wherein a viewer can enter a selection choice for a video program via the remote control unit to the set-top box and have the desired video program delivered instantaneously for display on the TV. Such VOD applications can include on-demand movies, documentaries, historic sports events, TV programs, commercials, advertisements, music videos, short-subjects, and even individual screen displays of information. VOD-based interactive television services generally allow a viewer to use the remote control to cursor through an on-screen menu and select from a variety of titles for stored video programs for individual viewing on demand. Advanced remote control units include button controls with VCR-like functions that enable the viewer to start, stop, pause, rewind, or replay a selected video program or segment. In the future, VOD-based interactive television services may be integrated with or delivered with other advanced interactive television services, such as webpage browsing, e-mail, television purchase ("t-commerce") transactions, and multimedia delivery.

With the increasing interactive functionality and customer reach of interactive television services, advertisers and content providers are find it increasingly attractive to employ on-demand advertising, program content, and TV transactions for home viewers. VOD content delivery platforms are being designed to seamlessly and conveniently deliver a wide range of types of advertising, content, and transaction services on demand to home viewers. An example of an advanced VOD delivery platform is the N-Band (TM) system offered by Navic Systems, Inc., d/b/a Navic Networks, of Needham, Mass. This is an integrated system which provides an application development platform for third party application developers to develop new VOD service applications, viewer interfaces, and ancillary interactive services for deployment on VOD channels of CATV operators in cable service areas throughout the U.S. A detailed description of the Navic N-Band system is contained in U.S. patent application 2002/066,106, filed on May 30, 2002, which is incorporated herein by reference.

Advanced digital set-top boxes also have the ability to collect data such as a log of channels tuned to and programs watched by the viewer. The set top box can be designed to collect and report this data automatically to the cable head end. At the head end location, the viewer data can be aggregated over many users with personally identifying data removed, and provided to advertisers and program sponsors for information in designing and targeting new ads and programs for viewer preferences, thereby resulting in increased viewership, higher viewer impressions per ad or program, and ultimately increased revenues.

Current VOD ads and program offerings are generally produced for mass audiences. It would be particularly desirable to adapt a VOD delivery platform to deliver ads, promotions, programs, and informational content by allowing viewers to navigate readily and visually to specific items of interest. Such visual navigation for content delivery would be more likely to create a satisfying viewer experi-

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ence, and also to engage individual viewers in on-demand TV services and transactions. It would also be a particularly desirable to adapt a VOD delivery platform to receive uploads of user ads from individuals such as through an online network for search, navigation, and display to TV subscribers.

### SUMMARY OF THE INVENTION

In accordance with a first objective of the present invention, a video-on-demand (VOD) content delivery system for delivery templated VOD content comprises:

- (a) a VOD Application Server located at a Cable Head End which manages a Database of templates for generating templated VOD content in response to requests for specific video content elements by viewer request signals transmitted from the TV equipment of a viewer to the Cable Head End;
- (b) a Video Server for storing video content encoded as video content elements and for supplying a requested video content element in response to the VOD Application Server for delivery to the TV equipment of the viewer; and
- (c) an Application Data Center for creating and storing a plurality of different templates ordered in a hierarchy for presentation of video content elements of different selected types categorized in hierarchical order, wherein a template for display of a video content element in a higher level of the hierarchy includes a link to one or more templates and video content elements in a lower level of the hierarchy, said plurality of hierarchically-ordered templates and links being stored in the Database managed by the VOD Application Server, and
- (d) wherein said VOD Application Server, in response to viewer request for a selected video content element of a higher order in the hierarchy, retrieves the corresponding template from said Database and corresponding video content element from said Video Server to provide a templated VOD content display on the viewer's TV equipment which includes one or more links to video content elements in a lower order of hierarchy, and upon viewer request selecting a link displayed in the templated VOD content to a video content element in the lower order of hierarchy, retrieves the corresponding template and video content element of lower order hierarchy for display on the viewer's TV equipment, thereby enabling the viewer to use drill-down navigation through TV displays of templated VOD content.

In a preferred embodiment of the templated VOD content delivery system, the system employs the templated content delivery to create a User Interface for the viewer to navigate through progressively more specific template (display ad) types linked in series to reach an end subject of interest to the viewer. Referred to herein as "Drill-Down Ads," the series of progressively more specific display ad types allow the subscriber to navigate to an end subject of interest while at the same time having a unique visual experience of moving visually through a series of ads mirroring the viewer's path to the end subject of interest.

As an example involving automobile advertising, the User Interface can provide a hierarchical ordering of video display ads that starts with an Auto Maker's ad displayed with links to Model ads. The viewer can select using the remote control unit a specific Model ad which is displayed with links to more specific levels of ads, such as "Custom

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Packages", "Feature/Options", or "Color/Styling", etc., until it reaches an end subject of interest to the subscriber. The viewer would thus be able to navigate to specific content of interest while traversing through video ad displays of the Auto Maker, Models, Model A, Features, etc. Similarly, the viewer can navigate to specific content of interest while traversing through video ad displays of Local Dealers, Dealer A, Current Sales Promotions, etc. The templated VOD ads are generated dynamically by searching the VOD Application database with each current request by a viewer. This enables the system to dynamically generate and display updated advertising content that remains current. For example, if the Auto Maker changes the Model types available, or if Local Dealer A changes its current sales promotions, that advertiser's ads can be updated with new content and selection options on the system database, and the new templated ads can be generated dynamically, instead of new ads having to be filmed, produced, contracted, and installed with the cable TV company. Many other types of ads, subjects, and other interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down ad designs.

In accordance with a second objective of the invention, a video-on-demand (VOD) content delivery system for managing, converting and displaying consumer-generated classified ads on TV comprises:

- (a) a Content Management Website for enabling individual users to upload classified ad content on an online network connection from their remote computers, said uploaded classified ad content including associated meta data for identifying the ad content by title and topical area;
- (b) a Content Screening Component for receiving the classified ad content uploaded to the Content Management Website and screening the content for objectionable text, audio, video and/or images in the content, and for rejecting said content if objectionable text, audio, video and/or images are found;
- (c) a Content Feed Component for automatically transferring the classified ad content screened by the Content Screening Component with the associated meta data and supplying them to a Content Conversion Component;
- (d) a Content Conversion Component for automatically converting the transferred classified ad content supplied from the Content Feed Component into a video data format compatible with the VOD content delivery system, and for automatically indexing the converted classified ad content in a Video Server database according to title and topical area as specified in the content meta data; and
- (e) a VOD Application Server, operatively connected between said Content Conversion Component and a Cable Head End connected via cable connection to the TV equipment of viewers, for delivering from the Cable Head End classified ad title and topical area listings data generated from the meta data for the classified ad content to be displayed on the TV equipment of viewers to enable their searching for classified ads of interest and, in response to a viewer request signal requesting a specific classified ad of interest transmitted via the TV equipment to the Cable Head End, for retrieving the requested classified ad from the

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Video Server database and transmitting it to be displayed to the viewer on their TV equipment.

In a preferred embodiment of the TV classified ads system, individual users can upload classified ad content via their web browser, including text, audio, video and/or image files in industry-standard file formats, to the Content Management Website. The Content Screening Component is configured to parse the input for objectionable text words in text files, detect objectionable audio words in audio files, and optically recognize objectionable images in graphics or video files. The Content Feed Component automatically transmits classified ad content that has been appropriately contracted for display (paid for, and within the contracted time period) to the Content Conversion Component and the Video Server database. The VOD Application Server responds to requests input by viewers via remote control and retrieves the requested classified ads indexed by their titles and topical areas from the Video Server database to be displayed on the viewer's TV. The Content Management Website can also include functions for: (a) Account Management of user transaction accounts; (b) Content Classification to facilitate user designation of titles and topical areas to uniquely and attractively identify their classified ads; (c) Bulletin Board for creation and management of consumer-generated content related to announcements and other items of general interest to be displayed to viewers in subsidiary displays; and (d) Transaction Processing for the processing the payment of user fees, changes, and refunds in the use of the system.

The foregoing and other objects, features and advantages of the invention are described in further detail below in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a diagram of an overall architecture for a VOD Content Delivery System in accordance with the present invention, FIG. 1B shows an example of Drill-Down Ad navigation, and FIG. 1C shows an example of the templated ad display model.

FIG. 2A is a process flow diagram of the overall architecture of a consumer generated Classified Ad application for the VOD Content Delivery System, FIG. 2B illustrates a Content Management Website for the Classified Ad application, FIG. 2C illustrates a Content Screening Component of the system, and FIG. 2D illustrates a Content Feed and Conversion Components of the system.

#### DETAILED DESCRIPTION OF INVENTION

Referring to FIG. 1A, an overall system architecture for a VOD content delivery system includes a VOD Application Server **10** located at a Cable Head End. The VOD Application Server **10** manages a Database **11** of templates and video content segments from Video Server **12** for generating templated VOD content. The VOD content is generated in response to a viewer request signal transmitted from the Digital Set Top Box **21** of a viewer's TV equipment through the Digital Cable Television System **13** to the VOD Application Server **10** at the Cable Head End. The VOD Application Server **10** may be of the type which enables any compatibly-developed VOD applications to be loaded on and operated on the server. An example of such a VOD Application Server is the Navic N-Band(TM) server as previously described. Templates for displaying VOD content are created at an Application Data Center **30** and stored in the Database **11** for use by the operative VOD application.

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The templates may be designed, for example, to present video ad content displays in a logo frame, or to provide navigation buttons and viewer selection options in a frame around currently displayed video content. In the preferred embodiment described in greater detail below, the templates are used to provide navigation aids in a series of progressively more focused ad display types. A Video Content Encoder **31** is used to encode raw video feeds into formatted video content segments compatible with the VOD platform and supply them through a Video Content Distribution Network **14** to the Video Server **12**.

In operation, the VOD Application Server **10** operates a VOD application for the CATV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer's remote control unit transmitting an IR signal to the Set Top Box **21** that is sent on a back channel of the Digital Cable Television System **13** to the VOD Application Server **10** at the Cable Head End. In response to the signal, the VOD Application Server **10** determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database **11** and video content segment from the Video Server **12**, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server **10** retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a "drill-down navigation" method to find specific end content of interest.

Referring to FIG. 1B, a preferred embodiment of the templated VOD content delivery system is shown providing a User Interface using Drill-Down Navigation through display ads, such as for automobile infomercials. When the viewer selects a VOD application (channel), such as "Wheels-On-Demand", the viewer's TV displays a Main Menu with buttons inviting the viewer to "Select Category". The viewer can select an "Auto" category, and the TV then displays an "Auto" menu with buttons inviting the viewer to "Select Make", such as Make A, Make B, etc. When the viewer makes a selection, such as Make A, the viewer's TV displays a further menu that is a Gateway into templated VOD content delivery which enables Drill-Down Navigation by templated display ads. Through the Gateway, the VOD Application leaves the Menu mode and enters the Drill Down Navigation mode for successively displays of hierarchically-ordered video content which allow the viewer to navigate to progressively more focused content. In this example, the highest level of the hierarchy includes categories for Model, Local Dealer, Sales Events, and/or Inventory. When the viewer selects a category such as "Model" from the Gateway, for example, the VOD Application creates a templated ad display showing video content generic to all models by that automaker framed in a frame which has links (buttons or choices) for a list of the specific models made by that automaker. When the viewer selects the link to a specific model, "Model A" for example, the VOD Application creates a templated ad display showing video content for Model A, and the viewer can then choose to run a long-form infomercial of the Model A video. Alternatively, the Drill-

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Down Navigation can continue with further levels of specificity, such as “Custom Packages”, “Options”, “Colors/Stylings”, etc. Similarly, the selection of the “Local Dealer” category from the Gateway can bring up a templated ad for local dealers with links to specific local dealers in the viewer’s cable service area, and a click on a specific “Dealer A” can bring up a templated ad for Dealer A with further links to more specific content pertaining to Dealer A, such as “Current Sales Promotions”, etc.

In this manner, the templated VOD content delivery system allows the viewer to navigate to specific content of high interest to the viewer using the Drill-Down ads as a navigation tool, while at the same time having a unique visual experience of moving through a series of ads mirroring the viewer’s path to the subject of interest. The templated VOD ads are generated dynamically by searching the Content/Template database with each request by a viewer, enabling the system to display updated navigation choices and content simply by updating the database with updated links and video content. For example, if the Auto Maker changes the Model types of autos currently available, or if Local Dealer A changes its current sales promotions for autos currently available, that advertiser’s ads can be updated with new, template frame navigation links and content, instead of entirely new ads or screen displays having to be shot, produced, contracted, delivered, and programmed with the cable TV company. Many other types of layered or in depth ads, subjects, and interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down Navigation designs.

In FIG. 1C, an example illustrates how a templated VOD display is generated in layers. A Background screen provides a basic color, logo, or graphical theme to the display. A selected Template (display frame) appropriate to the navigation level the intended display resides on is layered on the Background. The Template typically has a frame in which defined areas are reserved for text, display image(s), and navigation links (buttons). Finally, the desired content constituted by associated Text, Image & Buttons is retrieved from the database and layered on the Template. The resulting screen display shows the combined background logo or theme, navigation frame, and text, video images, and buttons.

Referring again to FIG. 1A, a Tracking System 15 of conventional type can be installed at the Cable Head End to aggregate non-personal data on what channels and programs viewers watch. For the Drill Down Navigation method, the Tracking System 15 can include tracking of the navigation paths viewers use to find subjects of interest in a VOD Application. The aggregation of viewer navigation data can indicate what subjects are most popular, whether some subjects are of greater interest to viewers at certain times of day, of certain demographics, or in relation to certain products or services. The VOD Application Server 10 can export the aggregated viewer navigation data to an external Profiling System 16, such as a non-biased or unrelated firm applying profile analysis methods. The results of the Profiling System 16 can be communicated to a Targeting System 17, such as a template design firm or content production company, to fine-tune the presentation of the templated VOD content consistent with viewer preferences or interests. The feedback from the Targeting System can be sup-

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plied as feedback to the VOD Application Server to modify the Content/Template Database 11.

Another application for the templated VOD content delivery system can be developed to support video advertisements which link national to local market ad campaigns in “drill-down” fashion. Advertisers, both national and local, can pay for placement of their video advertisements on the system. When the VOD Application is run, the national ads are displayed as a Gateway to linking to the local market ads. In this manner, national ads can be used to transition viewers from general interest in a product to finding specific information about the product available locally.

The templated VOD content delivery system can also support “traffic building” videos, including music videos, that may not generate direct revenue. Once a video is encoded and registered into the system, the management and distribution of the video is conducted through software systems and automated controls. The User Interface provides the user with the ability to navigate and find desired video content. Selection of a category presents the user with a list of video titles available for playback. Categories and title lists can be generated using real-time database queries, allowing for database-driven management of content within the User Interface. The User Interface can also support a search interface which allows the user to search the video content database to generate a list of video titles with specific characteristics.

The core services and functions of the VOD content delivery system can include:

- Encoding—converts videos to proper digital format for playback on cable video-on-demand systems, currently MPEG2 format
- Metadata Input—allows for the input of descriptive data regarding each video
- Packaging—Prepares a data package for transport consisting of the encoded video file and the metadata
- Scheduling—Establishes the schedule when packages are to be delivered to cable video-on-demand systems via the transport system
- Transport—Digital broadcast medium through which the packages are migrated from the central processing facility to the cable video-on-demand systems.

The core services and functions of the User Interface system can include:

- Development of UI “pages”—An Internet-based system is used for the composition, coding and quality assurance of the User Interface images (“pages”) that are presented to the user on an interactive basis.
- Category and List Presentation—The category lists and title lists presented to the user for navigation and selection can be generated and rendered real-time using database queries against the video metadata database. These lists can also be incorporated in the fully rendered graphics if real-time queries are not required or desired.
- Distribution—The UI system supports a scheduling and transport subsystem separate from the video distribution system for the distribution of the UI assets and related set-top box software components to local UI servers installed at the cable head end.
- User Input Device—The UI system receives user input and commands from the IR remote control used with the digital set-top box.
- User Database—The UI system maintains a database of set-top box addresses that is used to identify the users of the system. This database is the seed for the Profiling Database system described below.

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Targeting—The UI system is capable of changing the UI presentation to a specific user based on the information contained in the User Database and the Profiling Database.

The core services and functions of the Tracking System can include:

Consolidation of Video-On-Demand Data—The Tracking System can be made capable of ingesting and consolidating usage data provided by the cable video-on-demand systems. This may be performed through automated interfaces or “feeds”, or it may be performed through the batch processing of data files delivered by the cable operators.

Consolidation of UI Data—The Tracking System can gather and consolidate data from the UI system on an automated basis. The UI system can provide data describing the user commands, behaviors, responses and requests generated by each user while using the User Interface system.

Reporting—The Tracking System can generate reports and analyses of the Video-On-Demand data and the UI data.

Web Interface—The Tracking System can include a Web interface for providing authorized users such as advertisers with access to specific reports.

The core services and functions of the Profiling System can include:

Consolidation of Profiling Data—The Profiling System can be made capable of consolidating on a continuing, automated basis all user-related data requested by advertisers or by the system operator.

Interface to Targeting System—The Profiling System can provide pertinent data as required by the Targeting System within the UI system. This data is used to reformat UI presentations based on the data values.

Interface to Targeting System—The Profiling System data can be accessed and incorporated into the Targeting System.

Support of Private and Public Data—The Profiling System can segregate and maintain as private any data gathered specifically for an advertiser for the use of that advertiser.

As another aspect of the present invention, a VOD content delivery system may be adapted to offer consumer-generated classified ads on TV. The VOD content delivery system is provided with a Content Management frontend to receive consumer input and convert it to video display ads maintained in the system database. Referring to FIG. 2A, a system for managing, converting and displaying individual consumer-generated ads on a VOD content delivery system has a Web-based Content Management System 40 for enabling an individual user to upload content from their computer via a web browser to display a consumer-generated video ad on TV. The uploaded content includes meta data for classifying the video ad by title and topical area(s). Content Screening System 41 is used for screening the content input by the individual user, such as by performing automatic searching for objectionable text, audio, video and/or images and rejecting the content if found objectionable. A Content Feed System 42 is used to automatically transfer consumer-generated content screened through the Content Screening System 41 to a Content Conversion System 43. This system automatically converts the consumer-generated content supplied by the Content Feed System 42 into video display format compatible with the VOD content delivery system. The converted video ad is indexed by title and classified topical areas according to the meta data supplied by the user, in accordance with the indexing system maintained by the Content Management System. The VOD Content Delivery System 44 operates a Classified Ads VOD Application in which menus for finding classified ads

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are navigated by viewers, and specific classified ads are delivered through the Digital Cable Television System for display as video ads on the viewer's TV equipment in response to viewer request input by remote control to the Digital Set Top Box 21, as described previously with respect to the operation of the general VOD platform.

Referring to FIG. 2B, the Web-based Content Management System 40 includes a plurality of functional components to allow consumers to create and manage their own classified ads as interactive television content, as well as pay for the distribution of their content within the digital cable television system. A Classified Management Application 50 is used to receive consumer-input content, have it screened (by the Content Screening System 41, not shown), and store it in the Classified Metadata, Image and Video Database 51. Consumer payment for running video ads is handled by the Transaction Processing Component 53. Also included in the Content Management System is an Account Management Component 55 and Account & Permissions Database 56 for management of user accounts for use of the web-based TV Classified Ads system. A Bulletin Board Ads application may be operated in parallel with the TV Classified Ads application. A Bulletin Board Management Application 54 and Database 57 enable the creation and management of consumer-generated content relating to public announcements and other items of general interest for groups, organizations or topics. The preferred VOD Content Delivery System uses templated VOD content, and a Template Library 58 is used to store templates for both the Classified Ads and Bulletin Board Ads applications.

The Account Management Component controls the access by persons to the web-based Content Management System. The Account Management Component identifies persons accessing the system for the first time and allows these persons to register and create an account by providing an account name, password, credit card information and other information required for the payment of fees. The Account Management Component controls the access by registered users to their accounts and manages the privileges and security associated to all accounts. Persons may create accounts for the creation and management of Classified Ads. Accounts capable of accessing the Bulletin Board Management Application may also be assigned by a system administrator in the Account Management Component. Any account capable of accessing the Bulletin Board application can then create and manage bulletin board ads for the assigned bulletin boards.

The Classified Content Management System enables users to upload text, audio, video, and/or image files for classified ads in industry-standard file formats and have it converted into video display ads compatible with the VOD Content Delivery System. Classified ads are searched on the viewer's TV equipment by menus and lists indexed by title and topical areas corresponding to the metadata associated with the classified ads content. Selection of a listed item results in the display of a TV display ad containing uploaded text, images, video and/or audio. Users pay listing fees to the operator of the system for maintaining and displaying the classified ads on the digital cable television system.

Significant features of the Classified Ads Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) uploading digital images of the item to the Content Management System; (c) uploading digital video of the item to the Content Management System; (d) uploading digital audio regarding the item to the Content Management System; (e) automated size and resolution processing of digital images uploaded to the

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system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided content; (j) ability to save classified content in persistent memory or storage for subsequent modification; (k) ability to mark classified content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when a classified content item is to become accessible by users of the interactive television system and the data and time when a classified content item is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that a specific content item is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created classified content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific consumer-generated content by users of the interactive television system; and (p) ability to calculate fees for classified content and submit payment of the fees using the Transaction Processing system.

As noted in (i) above, the Classified Content Management System allows the user to view the content they have composed using the templates. The templates are designed specifically for use on interactive television systems and the user is able to view on the web-interface their content as composed for presentation on television. As noted in (j) above, the Classified Content Management System allows the persistent storage of classified content; although the user is composing interactive television pages using a template system, the content is persistently stored as individual elements to simplify changes by the user and to allow the conversion of the content to different formats as required by different interactive television systems.

The Bulletin Board Content Management System provides the users of the web-based Content Management System with content creation and content management tools for the creation and maintenance of consumer-generated content related to announcements and other informational items of general interest. Bulletin Board content is displayed on the interactive television system as dedicated interactive television screens (bulletin boards), where approved groups, organizations or topics are each assigned a bulletin board for the display of their information. Bulletin Board content is displayed as list items organized within a bulletin board; selection of a list item results in the display of an interactive television screen containing or providing access to the descriptive data, text, images, video and audio regarding the item.

An alternative implementation of a Bulletin Board can display the content as scrolling text, where the user scrolls through the text, or the text scrolls automatically. Bulletin Board accounts will pay fees determined by the operator of the system for the distribution of the bulletin board content on the interactive television system for display on the digital cable television system. Significant features of the Bulletin Board Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) upload digital images to the content management; (c) upload digital video to the content management system; (d) upload digital audio to the content management system; (e) automated size and resolution processing of digital images

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uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided bulletin board content; (j) ability to save bulletin board content in persistent memory or storage for subsequent modification; (k) ability to mark bulletin board content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when specific bulletin board content is to become accessible by users of the interactive television system and the data and time when specific bulletin board content is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that specific bulletin board content is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created bulletin board content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific bulletin board content by users of the interactive television system; and (p) ability to calculate fees for bulletin board content and submit payment of the fees in conjunction with the Transaction Processing component.

The Transaction Processing component allows users of the Classified Content Management System and Bulletin Board Content Management System to determine and pay for any fees resulting from their use of these systems. The Transaction Processing component will allow users to pay for fees using credit cards or other supported payment methods. Significant features of the Transaction Processing component include: (a) ability to maintain business rules for use by the Transaction Processing system to determine fees based on user type and content type; (b) ability to maintain business rules for one or more payment methods for use by the Transaction Processing system in handling the settlement of fees; (c) ability to maintain business rules for user account and payment settlement conditions such as delinquency and lack-of-credit for use by the Transaction Processing system in determining user account privileges and content status; and, (d) ability to process payment of fees in real-time for payment methods that support real-time settlement.

Referring to FIG. 2C, the Content Screening System (41) is comprised of a Text Screening Application 60 which searches for objectionable words or phrases, an Image Screening Application 61 which searches for objectionable graphic images, a Video Screening Application 62 which searches for objectionable images or audio words or phrases in video segments, and an Audio Screening Application 63 which searches for objectionable words or phrases in audio segments. The Content Screening System can be used for both Classified Ads content and Bulletin Board content. Content that has been screened by the Content Screening System is then transferred to the aforementioned Classified Ads Database 51 or the Bulletin Board Content Database 57. The system also has component 64 for Editorial and Customer Service Functions for Classified Ads, and component 65 similarly for Bulletin Board content. These can each include an Email Function to send confirmations of input, reasons for rejection of posting, suggested corrections, further processing, and posting of content to consumers using the system.

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Significant features of the Content Screening System include: (a) ability to maintain a library of objectionable or illegal words and phrases for use in the screening of text; (b) ability to perform automated analysis of user content text using the text library as an input and alert system administration personnel to the use of objectionable or illegal content and the use of unknown and suspect words or phrases; (c) ability to maintain a library of objectionable or illegal image elements for use in the screening of images; (d) ability to perform automated image recognition analysis against user content images using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (e) ability to maintain a library of objectionable or illegal image elements for use in the screening of video; (f) ability to perform automated image recognition analysis against user content video using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (g) ability to maintain a library of objectionable or illegal audio elements for use in the screening of audio; (h) ability to perform automated audio analysis against user content audio using the library of audio elements as an input and alert system administration personnel to the use of objectionable or illegal content; and (i) ability to save screened content in persistent memory or storage for subsequent processing. Content Screening is automatically performed with the Content Management System 40 during the user process of submitting and/or creating consumer-generated content or may be performed as a process subsequent to the creation of content by the user.

Referring to FIG. 2D, the Content Feed System 42 and the Content Conversion System 43 provide for the transfer of user content from the Content Screening System and conversion to video content format compatible with the VOD Content Delivery System 44. The Content Feed System 42 has a Content Selection/Date Filtering Application which selects consumer-generated content uploaded to the system that is within the dates contracted for posting and display of the content as Classified Ads or on Bulletin Boards. Content within the active date range is transferred to the Active Classified Ads Database 71A or the Active Bulletin Board Database 71B.

The Content Conversion System receives consumer-generated content in industry standard formats or created in viewable format (HTML) on the web-based input system and converts the content into formats compatible with the VOD Content Delivery System and for display on viewers' televisions. The Content Conversion System 43 has an Image Conversion Application 72 which converts consumer-uploaded image files (in industry-standard formats such as JPEG, GIF, TIFF, BMP, PDF, PPT, etc.) into VOD content format, a Video Conversion Application 73 which converts consumer-uploaded video files into VOD content format, and an Audio Conversion Application 74 which converts consumer-uploaded audio files into VOD content format. Content converted to VOD content format is stored in the Active Converted Classified Ads Database 75A or the Active Converted Bulletin Board Database 75B. The content is subject to a further Production Push Function 76A, 76B and stored in the Production Classified Ads Database 77A or the Production Bulletin Board Database 77B, if any presentation formatting, date stamping, template framing, or other system editing is required by the system.

Significant features of the Content Feed System include: (a) ability to select user content for submission to the Content Conversion System through the testing of appropriate parameters including the date and time information

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contained in the user content; (b) ability to appropriately package the elements of the user content to permit the efficient transfer of these content elements to the Content Conversion System through an Application Program Interface or other interface; (c) ability to create, maintain and execute a schedule for when the Content Feed System will execute on an automatic basis for the automatic transfer of consumer-generated content to the Content Conversion System; and, (d) ability to execute the functions of the Content Feed System on a manual basis in the presence or absence of a schedule. The Content Feed System may be able to package and distribute content to single or multiple Content Conversion Systems.

Significant features of the Content Conversion system include: (a) ability to receive content packages delivered by the Content Feed System through an Application Program Interface or other interface; (b) ability to process the elements of consumer-generated content into data, text, graphic, video and audio elements that are compatible with the interactive television system and maintain the content presentation created by the user on the web-based Content Management System; (c) ability to save reformatted content in persistent memory or storage for subsequent distribution and use by the interactive television system; and, (d) ability to inform the interactive television system that consumer-generated content is available for distribution and use. The Content Conversion System may be added as a component system of the VOD Content Delivery System, or it may be implemented as a wholly separate system that connects to the VOD Content Delivery System through an Application Program Interface or other interface. When implemented as a system that is separate from the VOD Content Delivery System, it is possible to support multiple, different interactive television systems by either (a) incorporating multiple formatting requirements into a single instance of the Content Conversion System or (b) creating multiple Content Conversion Systems, each supporting the formatting requirements for a specific interactive television system. Either implementation allows for a single instance of consumer-generated content that is created and maintained using the web-based Content Management System to be distributed and displayed on multiple, different interactive television systems with different formatting requirements.

The VOD Content Delivery System 44, as described previously, provides for the distribution of screened, converted, properly formatted consumer-generated content to viewers' televisions, typically through the use of digital set-top boxes connected to a digital cable television system capable of supporting real-time two-way data transfer between the set-top box and the Cable Head End. Significant features of the VOD Content Delivery System include: (a) ability to receive properly formatted content from the Content Conversion System; (b) ability to distribute said content over a digital cable television system and display this content on television as an interactive television presentation; (c) ability to receive user commands generated by an infrared remote control device, keyboard or other device; (d) ability to respond to the user commands by displaying appropriate content or executing desired functionality; and, (e) ability to generate and collect data regarding the user sessions and the viewing data regarding consumer-generated content on the interactive television system and make this data accessible to the Tracking System. The VOD Content Delivery System can employ templated VOD content delivery, as described previously with respect to FIG. 1A, enabling use of the Drill Down Navigation method in which



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viewers can navigate visually through classified ad hierarchical categories to specific titles or content.

The VOD Content Delivery System for the Classified Ads application can also employ the Tracking System **15** for the collection and consolidation of viewing data generated by the interactive television system and the generation of reports against this viewing data. For example, the Tracking System can track the number of viewer requests for viewing that a classified ad received in a given period and calculate billing charges accordingly. The Tracking System can make this information available to users of the Content Management System as well as to system administrative personnel performing general analysis of interactive television services and associated content. Significant features of the Tracking System include: (a) ability to access and process the data generated by the Classified Ads application; (b) ability to form summaries of the viewing data against desired parameters; (c) ability to save data, summaries and reports in persistent memory or storage for subsequent modification or access; (d) ability to make data, summaries and reports accessible by users of the web-based Content Management System, restricting the data accessible by any specific user to data regarding the content created by that user account on the Content Management System; and, (e) ability to make data, summaries and reports accessible by to system administration personnel.

It is understood that many modifications and variations may be devised given the above description of the principles of the invention. It is intended that all such modifications and variations be considered as within the spirit and scope of this invention, as defined in the following claims.

What is claimed is:

**1.** A set-top box, providing video-on-demand services and operatively connected to TV equipment of a TV service subscriber, programmed to perform the steps of:

(a) receiving, at the set-top box, via a closed system from a video-on-demand content delivery system comprising one or more computers and computer-readable memory operatively connected to the one or more computers, respective video-on-demand application-readable metadata that is associated with respective video content and is usable to generate a video-on-demand content menu;

wherein the respective video content was uploaded to a Web-based content management system by a respective content provider device associated with a respective video content provider via the Internet in a digital video format along with respective specified metadata including respective title information, category information, and subcategory information designated by the respective video content provider to specify a respective hierarchical location of a respective title of the respective video content within the video-on-demand content menu displayed on the TV equipment, wherein the respective video-on-demand application-readable metadata is generated according to the respective specified metadata;

(b) providing, to the TV subscriber at the set-top box, the video-on-demand content menu for navigating through titles, including the respective titles of the respective video content, in a drill-down manner by category information and subcategory information in order to locate a particular one of the titles whose associated video content is desired for viewing on the TV equipment, wherein the video-on-demand content menu lists the titles using the same hierarchical structure of respective category information and subcategory information

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as was designated by the respective video content provider in the respective specified metadata for the respective video content, wherein a plurality of different video display templates are accessible to the set-top box, and wherein the video-on-demand content menu is generated using at least one of the plurality of different video display templates and based at least upon the respective specified metadata; and

(c) in response to the TV service subscriber selecting, via a control unit in communication with the set-top box, a first respective title associated with a first video content from the hierarchical structure of respective category information and subcategory information of the video-on-demand content menu using drill-down navigation, transmitting the selection to the set-top box for display on the TV equipment; and

(d) receiving, at the set-top box, the first video content for display on the TV equipment of the TV service subscriber, wherein in response to the selection the first video content was retrieved from a video server associated with the video-on-demand content delivery system.

**2.** The set-top box of claim **1**, wherein the control unit is a remote control unit.

**3.** The set-top box of claim **1**, wherein the set-top box is programmed to allow the navigation through titles in a drill-down manner by navigation from a first level of the hierarchical structure of the video-on-demand content menu to a second level of the hierarchical structure to locate the particular one of the titles, wherein a first template of the plurality of different video display templates is used for displaying the first level of the hierarchical structure and wherein a second template of the plurality of different video display templates is used for displaying the second level of the hierarchical structure.

**4.** The set-top box of claim **3**, wherein the first level of the hierarchical structure in the video-on-demand content menu comprises a link to the second level of the hierarchical structure in the video-on-demand content menu.

**5.** The set-top box of claim **1**, wherein at least a first video display template of the plurality of different video display templates is associated with at least the first video content provider.

**6.** The set-top box of claim **1**, wherein some of the plurality of different video display templates correspond to different levels of the hierarchical structure of respective category information and subcategory information.

**7.** The set-top box of claim **1**, wherein the at least one of the plurality of different video display templates is configured to display a logo frame.

**8.** The set-top box of claim **1**, wherein the at least one of the plurality of different video display templates is configured to provide navigation buttons.

**9.** The set-top box of claim **1**, wherein the at least one of the plurality of different video display templates is configured to provide viewer selection options.

**10.** The set-top box of claim **1**, wherein the respective video-on-demand application-readable metadata further includes descriptive data about the video content.

**11.** The set-top box of claim **1**, wherein the respective video-on-demand application-readable metadata further includes at least one display image associated with the video content.

**12.** The set-top box of claim **1**, wherein the respective category information and subcategory information associ-



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ated with the first video content correspond to one or more topics that pertain to video content from more than one content provider.

13. The set-top box of claim 1, wherein the set-top box is further programmed to generate, using at least one of the plurality of different video display templates, a templated video-on-demand display that comprises a background and a template layer having one or more areas for display of metadata provided by the video content provider.

14. The set-top box of claim 1, wherein the set-top box is further programmed to track viewer navigation paths corresponding to the drill-down navigation.

15. The set-top box of claim 1, wherein the set-top box is further programmed to generate the video-on-demand content menu dynamically by retrieving menu content from a database operatively connected to the video-on-demand content delivery system and using the retrieved menu content with the at least one of the plurality of different video display templates.

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16. The set-top box of claim 1, wherein the set-top box is further programmed to generate, by real-time database queries of the respective category information and subcategory information uploaded by each respective video content provider, the hierarchical structure of category information and subcategory information in the video-on-demand content menu.

17. The set-top box of claim 1, wherein the video-on-demand content menu comprises a search interface that allows the TV subscriber to search a video content database based on specified characteristics.

18. The set-top box of claim 1, wherein the video-on-demand content menu is an interactive user interface.

19. The set-top box of claim 1, wherein the set-top box is further programmed to generate a templated video-on-demand display that comprises a background screen using at least one of the plurality of different video display templates.

\* \* \* \* \*

(12) **United States Patent**  
**Perez**

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(54) **VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS**

(58) **Field of Classification Search**  
CPC ..... H04N 21/234; H04N 21/235  
See application file for complete search history.

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(72) Inventor: **Milton Diaz Perez**, Tiburon, CA (US)

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(73) Assignee: **Broadband iTV, Inc.**, Honolulu, HI (US)

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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This patent is subject to a terminal disclaimer.

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PTAB Decision Denying Institution of Covered Business Method Patent Review, Apr. 1, 2015, CBM2014-00189, *Hawaiian Telcom, Inc. v. Broadband iTV, Inc.*, re U.S. Pat. No. 7,631,336.

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(Continued)

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**Related U.S. Application Data**

(57) **ABSTRACT**

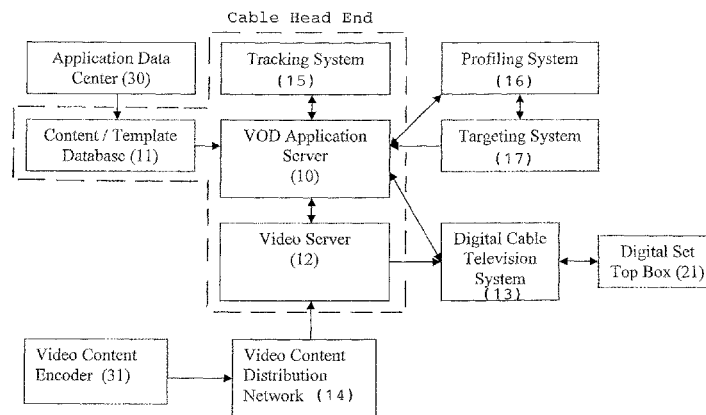
(60) Continuation of application No. 15/999,559, filed on Aug. 20, 2018, now Pat. No. 10,306,321, which is a (Continued)

A video-on-demand (VOD) content delivery system has a VOD Application Server which manages a database of templates for presentation of video content elements of different selected types categorized in hierarchical order. A web-based Content Management System receives content uploaded online in file formats with metadata for title and topical area, and automatically converts it into video data format compatible with the VOD content delivery system indexed by title and topical area. A User Interface for the system delivers listings data to the viewer's TV indexed by title and topical area specified by the uploaded metadata.

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(52) **U.S. Cl.**  
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**10 Claims, 7 Drawing Sheets**



VOD Content Delivery System, Overall Architecture

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## Related U.S. Application Data

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continuation of application No. 15/864,502, filed on Jan. 8, 2018, now Pat. No. 10,057,649, which is a continuation of application No. 15/582,155, filed on Apr. 28, 2017, now Pat. No. 9,866,909, which is a continuation of application No. 15/190,954, filed on Jun. 23, 2016, now Pat. No. 9,641,896, which is a continuation of application No. 14/978,881, filed on Dec. 22, 2015, now Pat. No. 9,386,340, which is a continuation of application No. 14/703,597, filed on May 4, 2015, now Pat. No. 9,232,275, which is a continuation of application No. 12/852,663, filed on Aug. 9, 2010, now Pat. No. 9,078,016, which is a division of application No. 11/952,552, filed on Dec. 7, 2007, now Pat. No. 7,774,819, which is a division of application No. 10/909,192, filed on Jul. 30, 2004, now Pat. No. 7,590,997.

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*H04N 21/84* (2011.01)  
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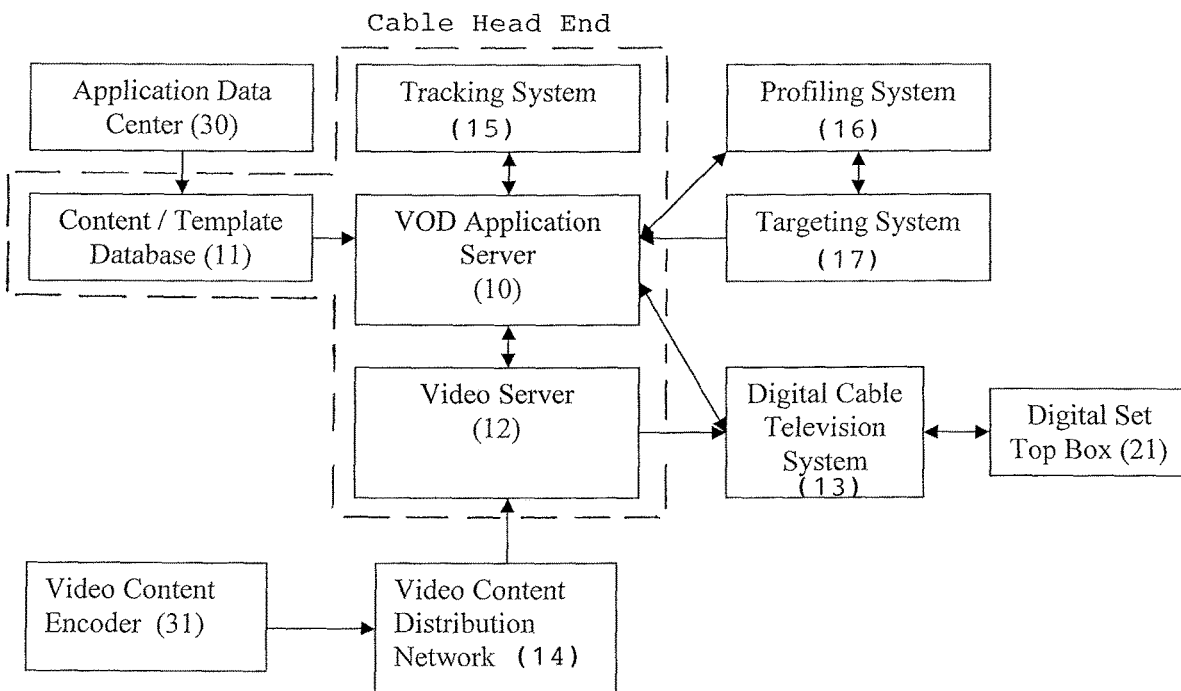


Figure 1A: VOD Content Delivery System, Overall Architecture

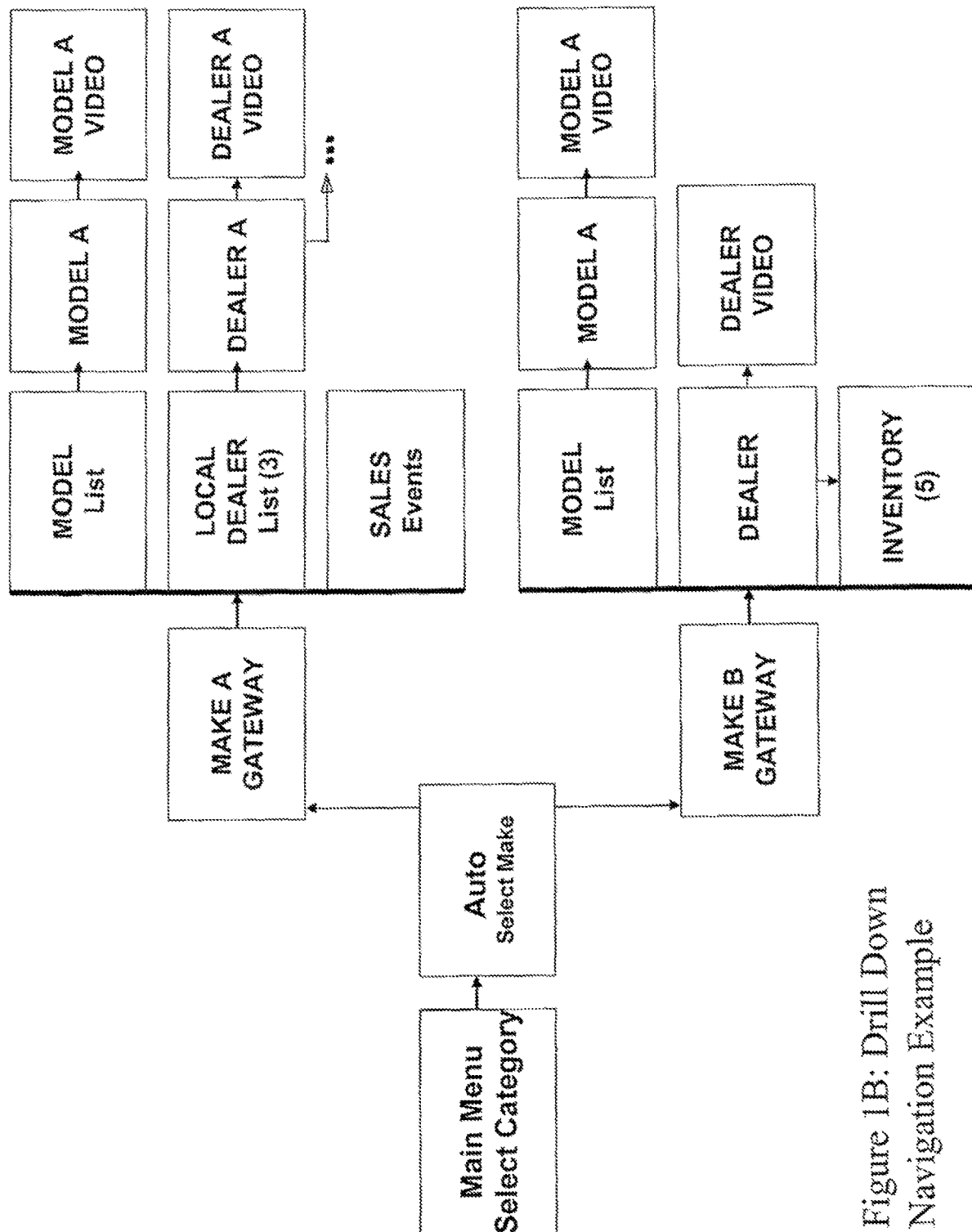
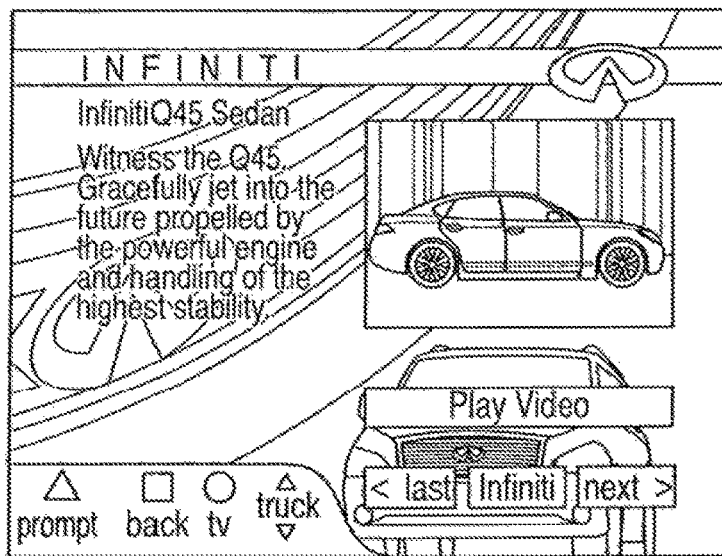
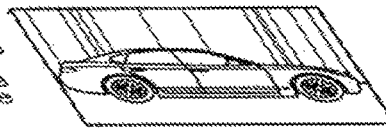


Figure 1B: Drill Down Navigation Example



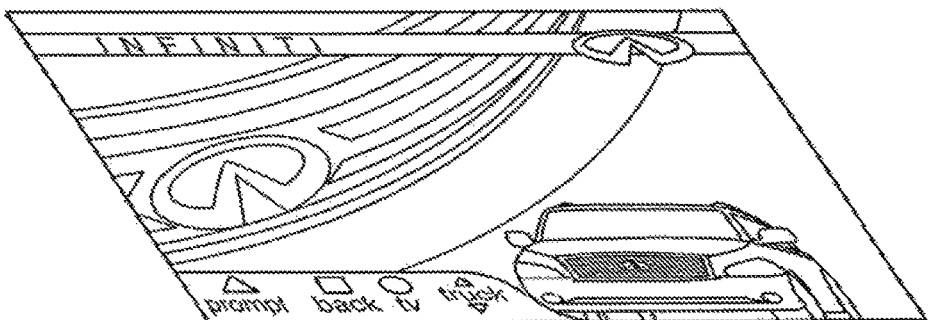
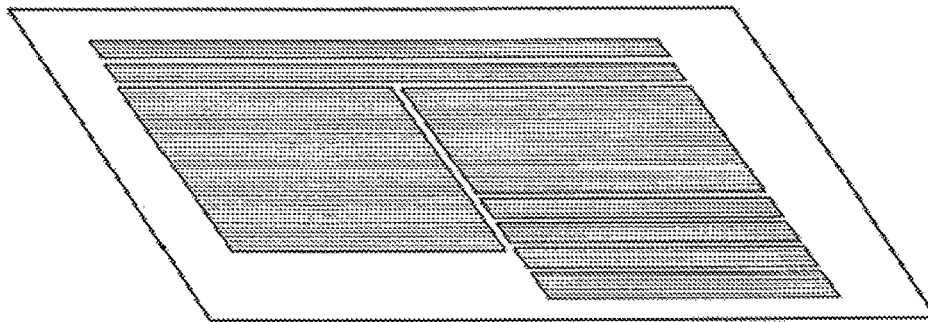
Infiniti Q45 Sedan  
Witness the Q45.  
Gracefully jet into the  
future propelled by  
the powerful engine  
and handling of the  
highest stability.



Play Video

< last Infiniti next >

FIG. 10C



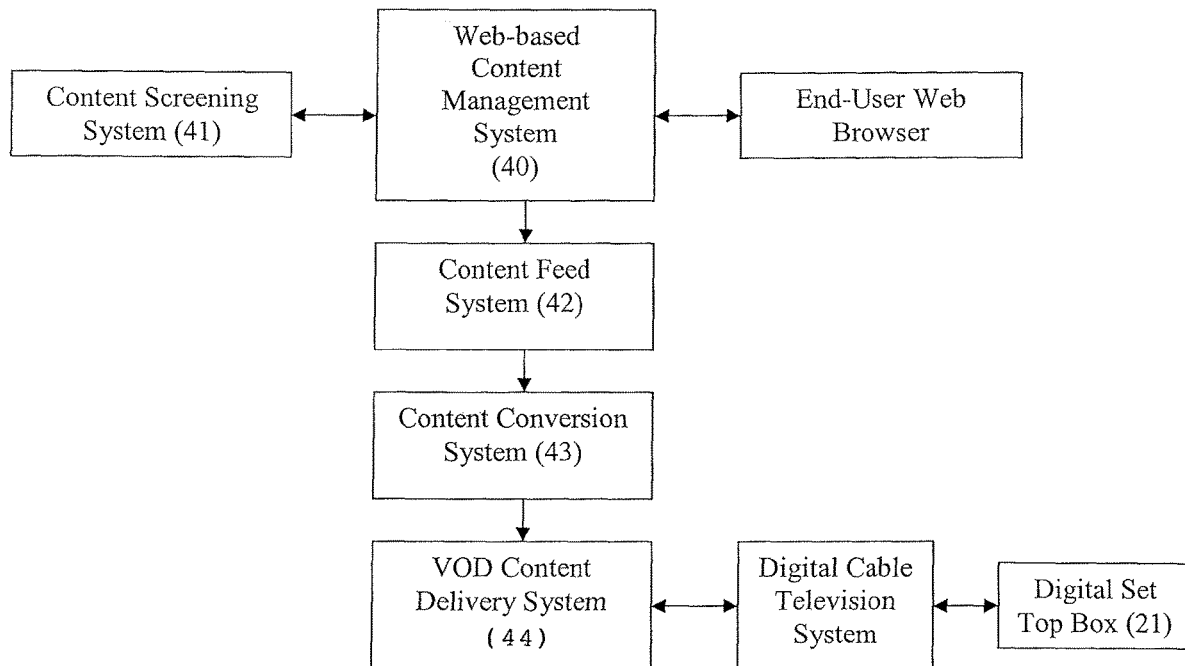


Figure 2A: Classified Ad System, Overall Architecture

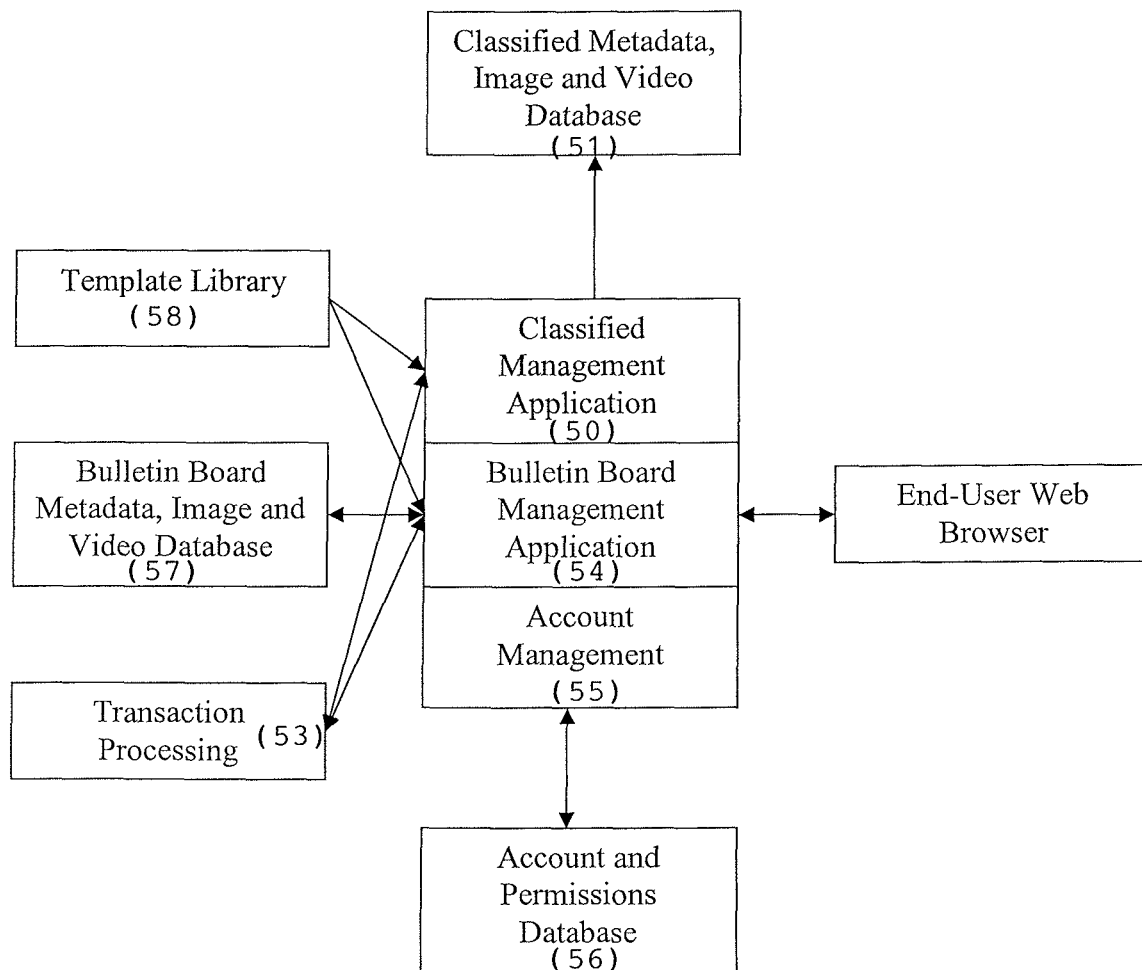


Figure 2B: Web-based Content Management System

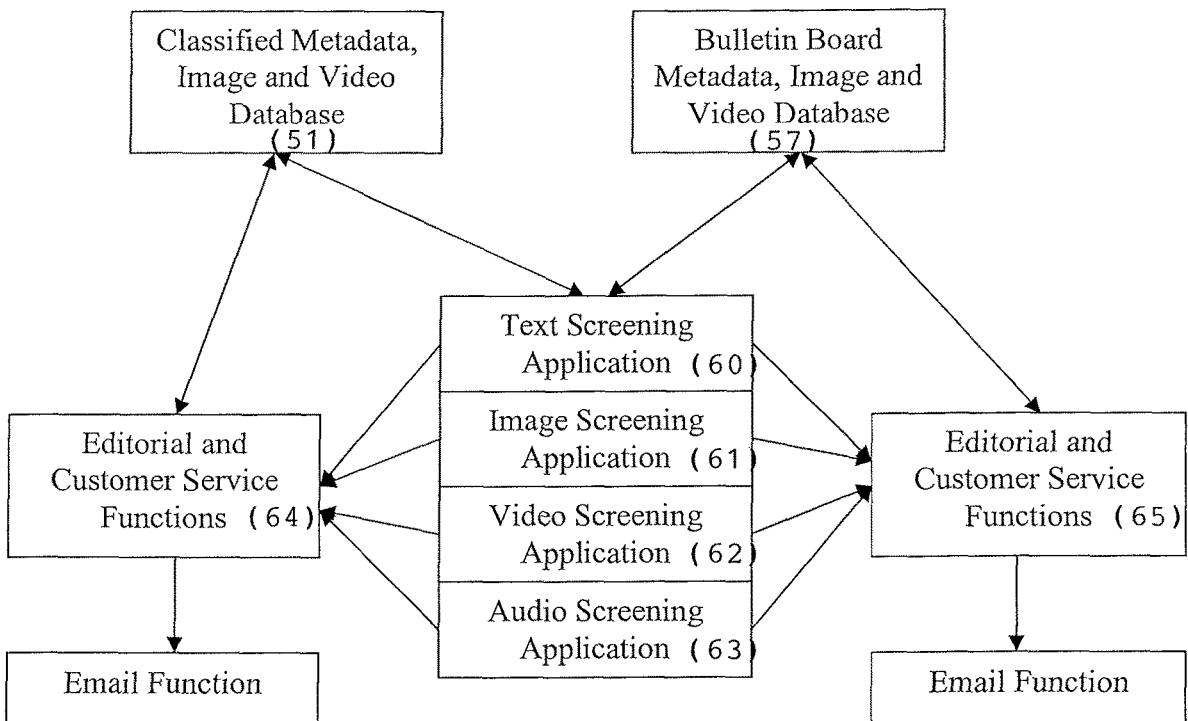


Figure 2C: Content Screening System

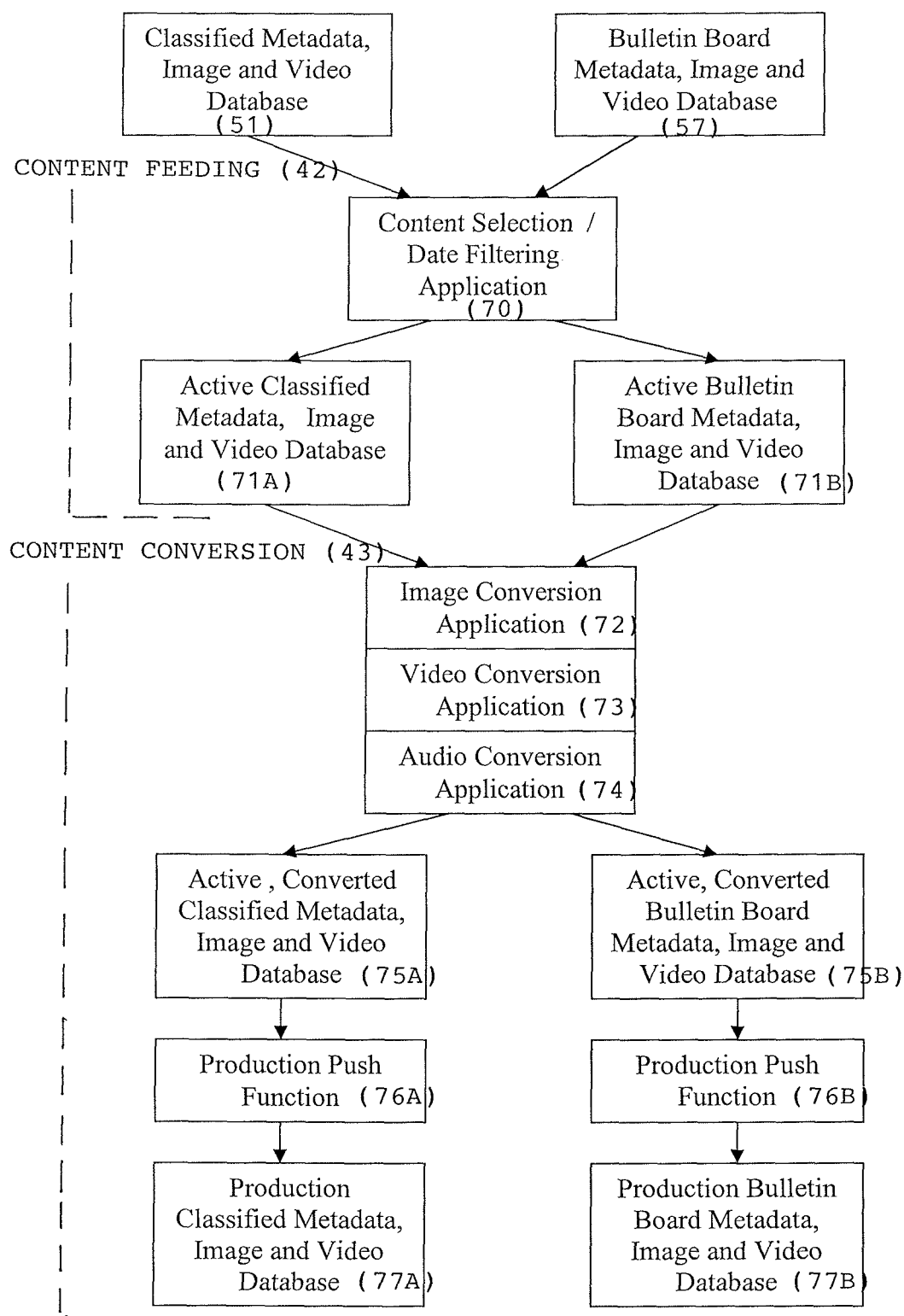


Figure 2D: Content Feed and Conversion System

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**VIDEO-ON-DEMAND CONTENT DELIVERY  
SYSTEM FOR PROVIDING  
VIDEO-ON-DEMAND SERVICES TO TV  
SERVICE SUBSCRIBERS**

**CROSS-REFERENCE TO RELATED  
APPLICATIONS**

This U.S. Patent Application is a continuation application and claims the benefit of co-pending U.S. patent application Ser. No. 15/999,559, filed on Aug. 20, 2018, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", which is a continuation application of U.S. patent application Ser. No. 15/864,502, filed Jan. 8, 2018, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 10,057,649 on Aug. 21, 2018, which is a continuation application of U.S. patent application Ser. No. 15/582,155, filed on Apr. 28, 2017, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,866,909 on Jan. 9, 2018, which is a continuation application of U.S. patent application Ser. No. 15/190,954, filed on Jun. 23, 2016, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY METHOD FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,641,896 on May 2, 2017, which is a continuation application of U.S. patent application Ser. No. 14/978,881, filed on Dec. 22, 2015, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,386,340 on Jul. 5, 2016, which is a continuation application of U.S. patent application Ser. No. 14/703,597, filed on May 4, 2015, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,232,275 on Jan. 5, 2016, which is a continuation application of U.S. patent application Ser. No. 12/852,663, filed on Aug. 9, 2010, of the same inventor and entitled "SYSTEM FOR ADDING OR UPDATING VIDEO CONTENT FROM INTERNET SOURCES TO EXISTING VIDEO-ON-DEMAND APPLICATION OF A DIGITAL TV SERVICES PROVIDER SYSTEM", issued as U.S. Pat. No. 9,078,016 on Jul. 7, 2015, which is a divisional application of U.S. patent application Ser. No. 11/952,552, filed on Dec. 7, 2007, of the same inventor and entitled "SYSTEM FOR MANAGING, CONVERTING, AND TRANSMITTING VIDEO CONTENT FOR UPLOADING ONLINE TO A DIGITAL TV SERVICES PROVIDER SYSTEM", issued as U.S. Pat. No. 7,774,819 on Aug. 10, 2010, which is a divisional application of U.S. patent application Ser. No. 10/909,192, filed on Jul. 30, 2004, of the same inventor and entitled "SYSTEM AND METHOD FOR MANAGING, CONVERTING AND DISPLAYING VIDEO CONTENT ON A VIDEO-ON-DEMAND PLATFORM, INCLUDING ADS USED FOR DRILL-DOWN NAVIGATION AND CONSUMER-GENERATED CLASSIFIED ADS", issued as U.S. Pat. No. 7,590,997 on Sep. 15, 2009, each of which is hereby incorporated by reference as if fully set forth herein.

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**TECHNICAL FIELD**

This invention generally relates to the provision of interactive television services through cable TV infrastructure, and more particularly, to a system and method for managing, converting and displaying video content on a video-on-demand platform, and particularly, advertising displays used for drill-down navigation and displays of consumer-generated classified ads on TV.

**BACKGROUND OF INVENTION**

Cable television (CATV) systems are used to deliver television services to a vast majority of TV-viewing homes in the U.S. and other technologically advanced countries. The typical CATV system has a cable service provider head end equipped with video servers to transmit CATV program signals through distribution lines to local nodes and from there to TV subscriber homes. Within the subscriber homes, the CATV program signals are transmitted to one or more customer-premises TVs which are coupled to external set-top boxes for channel tuning or are equipped with internal cable channel tuners.

Current CATV set-top boxes provide various functions for channel switching and program access between subscribers and the CATV head end. The more advanced digital set-top boxes are individually addressable from the CATV head end, and also allow subscribers to input via remote control units their selection inputs for transmission on a back channel of the connecting cable to the CATV head end, thereby enabling subscribers to access interactive television services and other types of advanced digital TV services. A primary type of interactive television system is referred to generally as a "video-on-demand" (VOD) system, wherein a viewer can enter a selection choice for a video program via the remote control unit to the set-top box and have the desired video program delivered instantaneously for display on the TV. Such VOD applications can include on-demand movies, documentaries, historic sports events, TV programs, commercials, advertisements, music videos, short-subjects, and even individual screen displays of information. VOD-based interactive television services generally allow a viewer to use the remote control to cursor through an on-screen menu and select from a variety of titles for stored video programs for individual viewing on demand. Advanced remote control units include button controls with VCR-like functions that enable the viewer to start, stop, pause, rewind, or replay a selected video program or segment. In the future, VOD-based interactive television services may be integrated with or delivered with other advanced interactive television services, such as webpage browsing, e-mail, television purchase ("t-commerce") transactions, and multimedia delivery.

With the increasing interactive functionality and customer reach of interactive television services, advertisers and content providers are finding it increasingly attractive to employ on-demand advertising, program content, and TV transactions for home viewers. VOD content delivery platforms are being designed to seamlessly and conveniently deliver a wide range of types of advertising, content, and transaction services on demand to home viewers. An example of an advanced VOD delivery platform is the N-Band<sup>TM</sup> system offered by Navic Systems, Inc., d/b/a Navic Networks, of Needham, Mass. This is an integrated system which provides an application development platform for third party application developers to develop new VOD service applications, viewer interfaces, and ancillary interactive services



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for deployment on VOD channels of CATV operators in cable service areas throughout the U.S. A detailed description of the Navic N-Band system is contained in U.S. Patent Application 2002/066,106, filed on May 30, 2002, which is incorporated herein by reference.

Advanced digital set-top boxes also have the ability to collect data such as a log of channels tuned to and programs watched by the viewer. The set top box can be designed to collect and report this data automatically to the cable head end. At the head end location, the viewer data can be aggregated over many users with personally identifying data removed, and provided to advertisers and program sponsors for information in designing and targeting new ads and programs for viewer preferences, thereby resulting in increased viewership, higher viewer impressions per ad or program, and ultimately increased revenues.

Current VOD ads and program offerings are generally produced for mass audiences. It would be particularly desirable to adapt a VOD delivery platform to deliver ads, promotions, programs, and informational content by allowing viewers to navigate readily and visually to specific items of interest. Such visual navigation for content delivery would be more likely to create a satisfying viewer experience, and also to engage individual viewers in on-demand TV services and transactions. It would also be a particularly desirable to adapt a VOD delivery platform to receive uploads of user ads from individuals such as through an online network for search, navigation, and display to TV subscribers.

#### SUMMARY OF THE INVENTION

In accordance with a first objective of the present invention, a video-on-demand (VOD) content delivery system for delivery templated VOD content comprises:

(a) a VOD Application Server located at a Cable Head End which manages a Database of templates for generating templated VOD content in response to requests for specific video content elements by viewer request signals transmitted from the TV equipment of a viewer to the Cable Head End;

(b) a Video Server for storing video content encoded as video content elements and for supplying a requested video content element in response to the VOD Application Server for delivery to the TV equipment of the viewer; and

(c) an Application Data Center for creating and storing a plurality of different templates ordered in a hierarchy for presentation of video content elements of different selected types categorized in hierarchical order, wherein a template for display of a video content element in a higher level of the hierarchy includes a link to one or more templates and video content elements in a lower level of the hierarchy, said plurality of hierarchically-ordered templates and links being stored in the Database managed by the VOD Application Server, and

(d) wherein said VOD Application Server, in response to viewer request for a selected video content element of a higher order in the hierarchy, retrieves the corresponding template from said Database and corresponding video content element from said Video Server to provide a templated VOD content display on the viewer's TV equipment which includes one or more links to video content elements in a lower order of hierarchy, and upon viewer request selecting a link displayed in the templated VOD content to a video content element in the lower order of hierarchy, retrieves the corresponding template and video content element of lower order hierarchy for display on the viewer's TV equipment,

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thereby enabling the viewer to use drill-down navigation through TV displays of templated VOD content.

In a preferred embodiment of the templated VOD content delivery system, the system employs the templated content delivery to create a User Interface for the viewer to navigate through progressively more specific template (display ad) types linked in series to reach an end subject of interest to the viewer. Referred to herein as "Drill-Down Ads," the series of progressively more specific display ad types allow the subscriber to navigate to an end subject of interest while at the same time having a unique visual experience of moving visually through a series of ads mirroring the viewer's path to the end subject of interest.

As an example involving automobile advertising, the User Interface can provide a hierarchical ordering of video display ads that starts with an Auto Maker's ad displayed with links to Model ads. The viewer can select using the remote control unit a specific Model ad which is displayed with links to more specific levels of ads, such as "Custom Packages", "Feature/Options", or "Color/Styling", etc., until it reaches an end subject of interest to the subscriber. The viewer would thus be able to navigate to specific content of interest while traversing through video ad displays of the Auto Maker, Models, Model A, Features, etc. Similarly, the viewer can navigate to specific content of interest while traversing through video ad displays of Local Dealers, Dealer A, Current Sales Promotions, etc. The templated VOD ads are generated dynamically by searching the VOD Application database with each current request by a viewer.

This enables the system to dynamically generate and display updated advertising content that remains current. For example, if the Auto Maker changes the Model types available, or if Local Dealer A changes its current sales promotions, that advertiser's ads can be updated with new content and selection options on the system database, and the new templated ads can be generated dynamically, instead of new ads having to be filmed, produced, contracted, and installed with the cable TV company. Many other types of ads, subjects, and other interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down ad designs.

In accordance with a second objective of the invention, a video-on-demand (VOD) content delivery system for managing, converting and displaying consumer-generated classified ads on TV comprises:

(a) a Content Management Website for enabling individual users to upload classified ad content on an online network connection from their remote computers, said uploaded classified ad content including associated meta data for identifying the ad content by title and topical area;

(b) a Content Screening Component for receiving the classified ad content uploaded to the Content Management Website and screening the content for objectionable text, audio, video and/or images in the content, and for rejecting said content if objectionable text, audio, video and/or images are found;

(c) a Content Feed Component for automatically transferring the classified ad content screened by the Content Screening Component with the associated meta data and supplying them to a Content Conversion Component;

(d) a Content Conversion Component for automatically converting the transferred classified ad content supplied from the Content Feed Component into a video data format compatible with the VOD content delivery system, and for

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automatically indexing the converted classified ad content in a Video Server database according to title and topical area as specified in the content meta data; and

(e) a VOD Application Server, operatively connected between said Content Conversion Component and a Cable Head End connected via cable connection to the TV equipment of viewers, for delivering from the Cable Head End classified ad title and topical area listings data generated from the meta data for the classified ad content to be displayed on the TV equipment of viewers to enable their searching for classified ads of interest and, in response to a viewer request signal requesting a specific classified ad of interest transmitted via the TV equipment to the Cable Head End, for retrieving the requested classified ad from the Video Server database and transmitting it to be displayed to the viewer on their TV equipment.

In a preferred embodiment of the TV classified ads system, individual users can upload classified ad content via their web browser, including text, audio, video and/or image files in industry-standard file formats, to the Content Management Website. The Content Screening Component is configured to parse the input for objectionable text words in text files, detect objectionable audio words in audio files, and optically recognize objectionable images in graphics or video files. The Content Feed Component automatically transmits classified ad content that has been appropriately contracted for display (paid for, and within the contracted time period) to the Content Conversion Component and the Video Server database. The VOD Application Server responds to requests input by viewers via remote control and retrieves the requested classified ads indexed by their titles and topical areas from the Video Server database to be displayed on the viewer's TV. The Content Management Website can also include functions for: (a) Account Management of user transaction accounts; (b) Content Classification to facilitate user designation of titles and topical areas to uniquely and attractively identify their classified ads; (c) Bulletin Board for creation and management of consumer-generated content related to announcements and other items of general interest to be displayed to viewers in subsidiary displays; and (d) Transaction Processing for the processing the payment of user fees, changes, and refunds in the use of the system.

The foregoing and other objects, features and advantages of the invention are described in further detail below in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a diagram of an overall architecture for a VOD Content Delivery System in accordance with the present invention, FIG. 1B shows an example of Drill-Down Ad navigation, and FIG. 1C shows an example of the templated ad display model.

FIG. 2A is a process flow diagram of the overall architecture of a consumer generated Classified Ad application for the VOD Content Delivery System, FIG. 2B illustrates a Content Management Website for the Classified Ad application, FIG. 2C illustrates a Content Screening Component of the system, and FIG. 2D illustrates a Content Feed and Conversion Components of the system.

#### DETAILED DESCRIPTION OF INVENTION

Referring to FIG. 1A, an overall system architecture for a VOD content delivery system includes a VOD Application Server 10 located at a Cable Head End. The VOD Applica-

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tion Server 10 manages a Database 11 of templates and video content segments from Video Server 12 for generating templated VOD content. The VOD content is generated in response to a viewer request signal transmitted from the Digital Set Top Box 21 of a viewer's TV equipment through the Digital Cable Television System 13 to the VOD Application Server 10 at the Cable Head End. The VOD Application Server 10 may be of the type which enables any compatibly-developed VOD applications to be loaded on and operated on the server. An example of such a VOD Application Server is the Navic N-Band™ server as previously described. Templates for displaying VOD content are created at an Application Data Center 30 and stored in the Database 11 for use by the operative VOD application. The templates may be designed, for example, to present video ad content displays in a logo frame, or to provide navigation buttons and viewer selection options in a frame around currently displayed video content. In the preferred embodiment described in greater detail below, the templates are used to provide navigation aids in a series of progressively more focused ad display types. A Video Content Encoder 31 is used to encode raw video feeds into formatted video content segments compatible with the VOD platform and supply them through a Video Content Distribution Network 14 to the Video Server 12.

In operation, the VOD Application Server 10 operates a VOD application for the CATV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer's remote control unit transmitting an IR signal to the Set Top Box 21 that is sent on a back channel of the Digital Cable Television System 13 to the VOD Application Server 10 at the Cable Head End. In response to the signal, the VOD Application Server 10 determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database 11 and video content segment from the Video Server 12, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server 10 retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a "drill-down navigation" method to find specific end content of interest.

Referring to FIG. 1B, a preferred embodiment of the templated VOD content delivery system is shown providing a User Interface using Drill-Down Navigation through display ads, such as for automobile infomercials. When the viewer selects a VOD application (channel), such as "Wheels-On-Demand", the viewer's TV displays a Main Menu with buttons inviting the viewer to "Select Category". The viewer can select an "Auto" category, and the TV then displays an "Auto" menu with buttons inviting the viewer to "Select Make", such as Make A, Make B, etc. When the viewer makes a selection, such as Make A, the viewer's TV displays a further menu that is a Gateway into templated VOD content delivery which enables Drill-Down Navigation by templated display ads. Through the Gateway, the VOD Application leaves the Menu mode and enters the Drill Down Navigation mode for successively displays of hierar-

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chically-ordered video content which allow the viewer to navigate to progressively more focused content. In this example, the highest level of the hierarchy includes categories for Model, Local Dealer, Sales Events, and/or Inventory. When the viewer selects a category such as “Model” from the Gateway, for example, the VOD Application creates a templated ad display showing video content generic to all models by that automaker framed in a frame which has links (buttons or choices) for a list of the specific models made by that automaker. When the viewer selects the link to a specific model, “Model A” for example, the VOD Application creates a templated ad display showing video content for Model A, and the viewer can then choose to run a long-form infomercial of the Model A video. Alternatively, the Drill-Down Navigation can continue with further levels of specificity, such as “Custom Packages”, “Options”, “Colors/Stylings”, etc. Similarly, the selection of the “Local Dealer” category from the Gateway can bring up a templated ad for local dealers with links to specific local dealers in the viewer’s cable service area, and a click on a specific “Dealer A” can bring up a templated ad for Dealer A with further links to more specific content pertaining to Dealer A, such as “Current Sales Promotions”, etc.

In this manner, the templated VOD content delivery system allows the viewer to navigate to specific content of high interest to the viewer using the Drill-Down ads as a navigation tool, while at the same time having a unique visual experience of moving through a series of ads mirroring the viewer’s path to the subject of interest. The templated VOD ads are generated dynamically by searching the Content/Template database with each request by a viewer, enabling the system to display updated navigation choices and content simply by updating the database with updated links and video content. For example, if the Auto Maker changes the Model types of autos currently available, or if Local Dealer A changes its current sales promotions for autos currently available, that advertiser’s ads can be updated with new, template frame navigation links and content, instead of entirely new ads or screen displays having to be shot, produced, contracted, delivered, and programmed with the cable TV company. Many other types of layered or in depth ads, subjects, and interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down Navigation designs.

In FIG. 1C, an example illustrates how a templated VOD display is generated in layers. A Background screen provides a basic color, logo, or graphical theme to the display. A selected Template (display frame) appropriate to the navigation level the intended display resides on is layered on the Background. The Template typically has a frame in which defined areas are reserved for text, display image(s), and navigation links (buttons). Finally, the desired content constituted by associated Text, Image & Buttons is retrieved from the database and layered on the Template. The resulting screen display shows the combined background logo or theme, navigation frame, and text, video images, and buttons.

Referring again to FIG. 1A, a Tracking System 15 of conventional type can be installed at the Cable Head End to aggregate non-personal data on what channels and programs viewers watch. For the Drill Down Navigation method, the Tracking System 15 can include tracking of the navigation paths viewers use to find subjects of interest in a VOD

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Application. The aggregation of viewer navigation data can indicate what subjects are most popular, whether some subjects are of greater interest to viewers at certain times of day, of certain demographics, or in relation to certain products or services. The VOD Application Server 10 can export the aggregated viewer navigation data to an external Profiling System 16, such as a non-biased or unrelated firm applying profile analysis methods. The results of the Profiling System 16 can be communicated to a Targeting System 17, such as a template design firm or content production company, to fine-tune the presentation of the templated VOD content consistent with viewer preferences or interests. The feedback from the Targeting System can be supplied as feedback to the VOD Application Server to modify the Content/Template Database 11.

Another application for the templated VOD content delivery system can be developed to support video advertisements which link national to local market ad campaigns in “drill-down” fashion. Advertisers, both national and local, can pay for placement of their video advertisements on the system. When the VOD Application is run, the national ads are displayed as a Gateway to linking to the local market ads. In this manner, national ads can be used to transition viewers from general interest in a product to finding specific information about the product available locally.

The templated VOD content delivery system can also support “traffic building” videos, including music videos, that may not generate direct revenue. Once a video is encoded and registered into the system, the management and distribution of the video is conducted through software systems and automated controls. The User Interface provides the user with the ability to navigate and find desired video content. Selection of a category presents the user with a list of video titles available for playback. Categories and title lists can be generated using real-time database queries, allowing for database-driven management of content within the User Interface. The User Interface can also support a search interface which allows the user to search the video content database to generate a list of video titles with specific characteristics.

The core services and functions of the VOD content delivery system can include:

Encoding—converts videos to proper digital format for playback on cable video-on-demand systems, currently MPEG2 format

Metadata Input—allows for the input of descriptive data regarding each video

Packaging—Prepares a data package for transport consisting of the encoded video file and the metadata

Scheduling—Establishes the schedule when packages are to be delivered to cable video-on-demand systems via the transport system

Transport—Digital broadcast medium through which the packages are migrated from the central processing facility to the cable video-on-demand systems.

The core services and functions of the User Interface system can include:

Development of UI “pages”—An Internet-based system is used for the composition, coding and quality assurance of the User Interface images (“pages”) that are presented to the user on an interactive basis.

Category and List Presentation—The category lists and title lists presented to the user for navigation and selection can be generated and rendered real-time using database queries against the video metadata database. These lists can also be incorporated in the fully rendered graphics if real-time queries are not required or desired.

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Distribution—The UI system supports a scheduling and transport subsystem separate from the video distribution system for the distribution of the UI assets and related set-top box software components to local UI servers installed at the cable head end.

User Input Device—The UI system receives user input and commands from the IR remote control used with the digital set-top box.

User Database—The UI system maintains a database of set-top box addresses that is used to identify the users of the system. This database is the seed for the Profiling Database system described below.

Targeting—The UI system is capable of changing the UI presentation to a specific user based on the information contained in the User Database and the Profiling Database.

The core services and functions of the Tracking System can include:

Consolidation of Video-On-Demand Data—The Tracking System can be made capable of ingesting and consolidating usage data provided by the cable video-on-demand systems. This may be performed through automated interfaces or “feeds”, or it may be performed through the batch processing of data files delivered by the cable operators.

Consolidation of UI Data—The Tracking System can gather and consolidate data from the UI system on an automated basis. The UI system can provide data describing the user commands, behaviors, responses and requests generated by each user while using the User Interface system.

Reporting—The Tracking System can generate reports and analyses of the Video-On-Demand data and the UI data.

Web Interface—The Tracking System can include a Web interface for providing authorized users such as advertisers with access to specific reports.

The core services and functions of the Profiling System can include:

Consolidation of Profiling Data—The Profiling System can be made capable of consolidating on a continuing, automated basis all user-related data requested by advertisers or by the system operator.

Interface to Targeting System—The Profiling System can provide pertinent data as required by the Targeting System within the UI system. This data is used to reformat UI presentations based on the data values.

Interface to Targeting System—The Profiling System data can be accessed and incorporated into the Targeting System.

Support of Private and Public Data—The Profiling System can segregate and maintain as private any data gathered specifically for an advertiser for the use of that advertiser.

As another aspect of the present invention, a VOD content delivery system may be adapted to offer consumer-generated classified ads on TV. The VOD content delivery system is provided with a Content Management frontend to receive consumer input and convert it to video display ads maintained in the system database. Referring to FIG. 2A, a system for managing, converting and displaying individual consumer-generated ads on a VOD content delivery system has a Web-based Content Management System **40** for enabling an individual user to upload content from their computer via a web browser to display a consumer-generated video ad on TV. The uploaded content includes meta data for classifying the video ad by title and topical area(s). Content Screening System **41** is used for screening the content input by the individual user, such as by performing automatic searching for objectionable text, audio, video and/or images and rejecting the content if found objection-

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able. A Content Feed System **42** is used to automatically transfer consumer-generated content screened through the Content Screening System **41** to a Content Conversion System **43**. This system automatically converts the consumer-generated content supplied by the Content Feed System **42** into video display format compatible with the VOD content delivery system. The converted video ad is indexed by title and classified topical areas according to the meta data supplied by the user, in accordance with the indexing system maintained by the Content Management System. The VOD Content Delivery System **44** operates a Classified Ads VOD Application in which menus for finding classified ads are navigated by viewers, and specific classified ads are delivered through the Digital Cable Television System for display as video ads on the viewer's TV equipment in response to viewer request input by remote control to the Digital Set Top Box **21**, as described previously with respect to the operation of the general VOD platform.

Referring to FIG. 2B, the Web-based Content Management System **40** includes a plurality of functional components to allow consumers to create and manage their own classified ads as interactive television content, as well as pay for the distribution of their content within the digital cable television system. A Classified Management Application **50** is used to receive consumer-input content, have it screened (by the Content Screening System **41**, not shown), and store it in the Classified Metadata, Image and Video Database **51**. Consumer payment for running video ads is handled by the Transaction Processing Component **53**. Also included in the Content Management System is an Account Management Component **55** and Account & Permissions Database **56** for management of user accounts for use of the web-based TV Classified Ads system. A Bulletin Board Ads application may be operated in parallel with the TV Classified Ads application. A Bulletin Board Management Application **54** and Database **57** enable the creation and management of consumer-generated content relating to public announcements and other items of general interest for groups, organizations or topics. The preferred VOD Content Delivery System uses templated VOD content, and a Template Library **58** is used to store templates for both the Classified Ads and Bulletin Board Ads applications.

The Account Management Component controls the access by persons to the web-based Content Management System. The Account Management Component identifies persons accessing the system for the first time and allows these persons to register and create an account by providing an account name, password, credit card information and other information required for the payment of fees. The Account Management Component controls the access by registered users to their accounts and manages the privileges and security associated to all accounts. Persons may create accounts for the creation and management of Classified Ads. Accounts capable of accessing the Bulletin Board Management Application may also be assigned by a system administrator in the Account Management Component. Any account capable of accessing the Bulletin Board application can then create and manage bulletin board ads for the assigned bulletin boards.

The Classified Content Management System enables users to upload text, audio, video, and/or image files for classified ads in industry-standard file formats and have it converted into video display ads compatible with the VOD Content Delivery System. Classified ads are searched on the viewer's TV equipment by menus and lists indexed by title and topical areas corresponding to the metadata associated with the classified ads content. Selection of a listed item

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results in the display of a TV display ad containing uploaded text, images, video and/or audio. Users pay listing fees to the operator of the system for maintaining and displaying the classified ads on the digital cable television system.

Significant features of the Classified Ads Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) uploading digital images of the item to the Content Management System; (c) uploading digital video of the item to the Content Management System; (d) uploading digital audio regarding the item to the Content Management System; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided content; (j) ability to save classified content in persistent memory or storage for subsequent modification; (k) ability to mark classified content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when a classified content item is to become accessible by users of the interactive television system and the data and time when a classified content item is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that a specific content item is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created classified content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific consumer-generated content by users of the interactive television system; and (p) ability to calculate fees for classified content and submit payment of the fees using the Transaction Processing System.

As noted in (i) above, the Classified Content Management System allows the user to view the content they have composed using the templates. The templates are designed specifically for use on interactive television systems and the user is able to view on the web-interface their content as composed for presentation on television. As noted in (j) above, the Classified Content Management System allows the persistent storage of classified content; although the user is composing interactive television pages using a template system, the content is persistently stored as individual elements to simplify changes by the user and to allow the conversion of the content to different formats as required by different interactive television systems.

The Bulletin Board Content Management System provides the users of the web-based Content Management System with content creation and content management tools for the creation and maintenance of consumer-generated content related to announcements and other informational items of general interest. Bulletin Board content is displayed on the interactive television system as dedicated interactive television screens (bulletin boards), where approved groups, organizations or topics are each assigned a bulletin board for the display of their information. Bulletin Board content is displayed as list items organized within a bulletin board; selection of a list item results in the display of an interactive television screen containing or providing access to the descriptive data, text, images, video and audio regarding the item.

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An alternative implementation of a Bulletin Board can display the content as scrolling text, where the user scrolls through the text, or the text scrolls automatically. Bulletin Board accounts will pay fees determined by the operator of the system for the distribution of the bulletin board content on the interactive television system for display on the digital cable television system. Significant features of the Bulletin Board Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) upload digital images to the content management; (c) upload digital video to the content management system; (d) upload digital audio to the content management system; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided bulletin board content; (j) ability to save bulletin board content in persistent memory or storage for subsequent modification; (k) ability to mark bulletin board content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when specific bulletin board content is to become accessible by users of the interactive television system and the data and time when specific bulletin board content is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that specific bulletin board content is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created bulletin board content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific bulletin board content by users of the interactive television system; and (p) ability to calculate fees for bulletin board content and submit payment of the fees in conjunction with the Transaction Processing component.

The Transaction Processing component allows users of the Classified Content Management System and Bulletin Board Content Management System to determine and pay for any fees resulting from their use of these systems. The Transaction Processing component will allow users to pay for fees using credit cards or other supported payment methods. Significant features of the Transaction Processing component include: (a) ability to maintain business rules for use by the Transaction Processing system to determine fees based on user type and content type; (b) ability to maintain business rules for one or more payment methods for use by the Transaction Processing system in handling the settlement of fees; (c) ability to maintain business rules for user account and payment settlement conditions such as delinquency and lack-of-credit for use by the Transaction Processing system in determining user account privileges and content status; and, (d) ability to process payment of fees in real-time for payment methods that support real-time settlement.

Referring to FIG. 2C, the Content Screening System (41) is comprised of a Text Screening Application 60 which searches for objectionable words or phrases, an Image Screening Application 61 which searches for objectionable graphic images, a Video Screening Application 62 which searches for objectionable images or audio words or phrases in video segments, and an Audio Screening Application 63 which searches for objectionable words or phrases in audio

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segments. The Content Screening System can be used for both Classified Ads content and Bulletin Board content. Content that has been screened by the Content Screening System is then transferred to the aforementioned Classified Ads Database **51** or the Bulletin Board Content Database **57**. The system also has component **64** for Editorial and Customer Service Functions for Classified Ads, and component **65** similarly for Bulletin Board content. These can each include an Email Function to send confirmations of input, reasons for rejection of posting, suggested corrections, further processing, and posting of content to consumers using the system.

Significant features of the Content Screening System include: (a) ability to maintain a library of objectionable or illegal words and phrases for use in the screening of text; (b) ability to perform automated analysis of user content text using the text library as an input and alert system administration personnel to the use of objectionable or illegal content and the use of unknown and suspect words or phrases; (c) ability to maintain a library of objectionable or illegal image elements for use in the screening of images; (d) ability to perform automated image recognition analysis against user content images using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (e) ability to maintain a library of objectionable or illegal image elements for use in the screening of video; (f) ability to perform automated image recognition analysis against user content video using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (g) ability to maintain a library of objectionable or illegal audio elements for use in the screening of audio; (h) ability to perform automated audio analysis against user content audio using the library of audio elements as an input and alert system administration personnel to the use of objectionable or illegal content; and (i) ability to save screened content in persistent memory or storage for subsequent processing. Content Screening is automatically performed with the Content Management System **40** during the user process of submitting and/or creating consumer-generated content or may be performed as a process subsequent to the creation of content by the user.

Referring to FIG. 2D, the Content Feed System **42** and the Content Conversion System **43** provide for the transfer of user content from the Content Screening System and conversion to video content format compatible with the VOD Content Delivery System **44**. The Content Feed System **42** has a Content Selection/Date Filtering Application which selects consumer-generated content uploaded to the system that is within the dates contracted for posting and display of the content as Classified Ads or on Bulletin Boards. Content within the active date range is transferred to the Active Classified Ads Database **71A** or the Active Bulletin Board Database **71B**.

The Content Conversion System receives consumer-generated content in industry standard formats or created in viewable format (HTML) on the web-based input system and converts the content into formats compatible with the VOD Content Delivery System and for display on viewers' televisions. The Content Conversion System **43** has an Image Conversion Application **72** which converts consumer-uploaded image files (in industry-standard formats such as JPEG, GIF, TIFF, BMP, PDF, PPT, etc.) into VOD content format, a Video Conversion Application **73** which converts consumer-uploaded video files into VOD content format, and an Audio Conversion Application **74** which converts consumer-uploaded audio files into VOD content

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format. Content converted to VOD content format is stored in the Active Converted Classified Ads Database **75A** or the Active Converted Bulletin Board Database **75B**. The content is subject to a further Production Push Function **76A**, **76B** and stored in the Production Classified Ads Database **77A** or the Production Bulletin Board Database **77B**, if any presentation formatting, date stamping, template framing, or other system editing is required by the system.

Significant features of the Content Feed System include: (a) ability to select user content for submission to the Content Conversion System through the testing of appropriate parameters including the date and time information contained in the user content; (b) ability to appropriately package the elements of the user content to permit the efficient transfer of these content elements to the Content Conversion System through an Application Program Interface or other interface; (c) ability to create, maintain and execute a schedule for when the Content Feed System will execute on an automatic basis for the automatic transfer of consumer-generated content to the Content Conversion System; and, (d) ability to execute the functions of the Content Feed System on a manual basis in the presence or absence of a schedule. The Content Feed System may be able to package and distribute content to single or multiple Content Conversion Systems.

Significant features of the Content Conversion system include: (a) ability to receive content packages delivered by the Content Feed System through an Application Program Interface or other interface; (b) ability to process the elements of consumer-generated content into data, text, graphic, video and audio elements that are compatible with the interactive television system and maintain the content presentation created by the user on the web-based Content Management System; (c) ability to save reformatted content in persistent memory or storage for subsequent distribution and use by the interactive television system; and, (d) ability to inform the interactive television system that consumer-generated content is available for distribution and use. The Content Conversion System may be added as a component system of the VOD Content Delivery System, or it may be implemented as a wholly separate system that connects to the VOD Content Delivery System through an Application Program Interface or other interface. When implemented as a system that is separate from the VOD Content Delivery System, it is possible to support multiple, different interactive television systems by either (a) incorporating multiple formatting requirements into a single instance of the Content Conversion System or (b) creating multiple Content Conversion Systems, each supporting the formatting requirements for a specific interactive television system. Either implementation allows for a single instance of consumer-generated content that is created and maintained using the web-based Content Management System to be distributed and displayed on multiple, different interactive television systems with different formatting requirements.

The VOD Content Delivery System **44**, as described previously, provides for the distribution of screened, converted, properly formatted consumer-generated content to viewers' televisions, typically through the use of digital set-top boxes connected to a digital cable television system capable of supporting real-time two-way data transfer between the set-top box and the Cable Head End. Significant features of the VOD Content Delivery System include: (a) ability to receive properly formatted content from the Content Conversion System; (b) ability to distribute said content over a digital cable television system and display this content on television as an interactive television presenta-

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tion; (c) ability to receive user commands generated by an infrared remote control device, keyboard or other device; (d) ability to respond to the user commands by displaying appropriate content or executing desired functionality; and, (e) ability to generate and collect data regarding the user sessions and the viewing data regarding consumer-generated content on the interactive television system and make this data accessible to the Tracking System. The VOD Content Delivery System can employ templated VOD content delivery, as described previously with respect to FIG. 1A, enabling use of the Drill Down Navigation method in which viewers can navigate visually through classified ad hierarchical categories to specific titles or content.

The VOD Content Delivery System for the Classified Ads application can also employ the Tracking System 15 for the collection and consolidation of viewing data generated by the interactive television system and the generation of reports against this viewing data. For example, the Tracking System can track the number of viewer requests for viewing that a classified ad received in a given period and calculate billing charges accordingly. The Tracking System can make this information available to users of the Content Management System as well as to system administrative personnel performing general analysis of interactive television services and associated content. Significant features of the Tracking System include: (a) ability to access and process the data generated by the Classified Ads application; (b) ability to form summaries of the viewing data against desired parameters; (c) ability to save data, summaries and reports in persistent memory or storage for subsequent modification or access; (d) ability to make data, summaries and reports accessible by users of the web-based Content Management System, restricting the data accessible by any specific user to data regarding the content created by that user account on the Content Management System; and, (e) ability to make data, summaries and reports accessible by to system administration personnel.

It is understood that many modifications and variations may be devised given the above description of the principles of the invention. It is intended that all such modifications and variations be considered as within the spirit and scope of this invention, as defined in the following claims.

What is claimed is:

1. A video-on-demand application server system comprising one or more computers and computer-readable memory operatively connected to the one or more computers of the video-on-demand application server system, and programmed to perform at least the following steps:

(a) receiving, by the video-on-demand application server system from a Web-based content management system, first video-on-demand application-readable metadata associated with first video content and usable to generate a video-on-demand content menu,

wherein the first video-on-demand application-readable metadata comprises:

- (1) first title information comprising a first title, and
- (2) first content provider designated hierarchically arranged category information and subcategory information to specify a location of the first title information for the video content in a video-on-demand application, the first content provider designated category information and subcategory information associated with the first title information of the first video content using a same hierarchical structure of categories and subcategories as is to be used for placement of the first title information in the video-on-demand content menu;

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wherein the received first video content was uploaded to the Web-based content management system by a content provider device associated with a first video content provider via the Internet in a digital video format, along with the associated first video-on-demand application-readable metadata including first title information, and first content provider designated hierarchically arranged category information and subcategory information, designated by the first video content provider, to specify a hierarchical location of the first title of the first video content within the video-on-demand content menu using first category information and first subcategory information associated with the first title information;

(b) generating, by the video-on-demand application server system, video-on-demand content menu information data, including at least the first video-on-demand application-readable metadata associated with the first video content and usable to populate the video-on-demand content menu;

(c) sending, from the video-on-demand application server system to a respective set top box operatively connected to respective television equipment of a respective television service subscriber the generated video-on-demand content menu information data;

(d) generating, at the respective set-top box, using the video-on-demand content menu information data, the video-on-demand content menu for navigating through titles, including the first title of the first video content, by hierarchically-arranged category information and subcategory information, including at least the first category information and the first subcategory information in order to locate a respective one of the titles whose associated video content is desired for viewing on respective television equipment,

wherein the video-on-demand content menu lists the titles using the same hierarchical structure of category information and subcategory information as was designated by one or more video content providers, including the first video content provider, in the uploaded first video-on-demand application-readable metadata for the respective video content, wherein a plurality of different display templates, including a first display template, are accessible;

(e) receiving, by the video-on-demand application server system from the respective set top box, an electronic request for the first video content associated with the selected first title for display on the television equipment of the television service subscriber in response to the respective television service subscriber selecting, via a television control unit in communication with the respective set top box, the respective title associated with the video content from the hierarchically-arranged category information and subcategory information of the video-on-demand content menu;

(f) causing, by the video-on-demand application server system, to be transmitted to the respective set top box from a video server, the selected first video content for display on the respective TV equipment.

2. The video-on-demand application server system of claim 1, wherein the television control unit is a remote control unit.

3. The video-on-demand application server system of claim 1, wherein at least some of the plurality of different display templates correspond to different levels of the hierarchical structure of the respective category information and subcategory information.

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4. The video-on-demand application server system of claim 1, wherein the at least one of the plurality of different display templates is configured to display a logo frame.

5. The video-on-demand application server system of claim 1, wherein the at least one of the plurality of different display templates is configured to provide navigation buttons.

6. The video-on-demand application server system of claim 1, wherein the at least one of the plurality of different display templates is configured to provide viewer selection options.

7. The video-on-demand application server system of claim 1, wherein the respective category information and subcategory information associated with the first video content correspond to one or more topics that pertain to video content from more than one video content provider.

8. The video-on-demand application server system of claim 1, wherein at least one of the plurality of different display templates is used to generate a templated video-on-demand display that comprises a background and a template layer having one or more areas for display of the first video-on-demand application-readable metadata provided by the video content provider.

9. The video-on-demand application server system of claim 1, wherein the video-on-demand content menu comprises a search interface that allows the television service subscriber to search a video content database based on specified characteristics.

10. The video-on-demand application server system of claim 1, wherein the video-on-demand content menu is an interactive user interface.

\* \* \* \* \*

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(12) **United States Patent**  
**Perez**

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(45) **Date of Patent:** **\*Jan. 14, 2020**

(54) **VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS**

(58) **Field of Classification Search**  
CPC ..... H04N 21/234; H04N 21/235  
See application file for complete search history.

(71) Applicant: **Broadband iTV, Inc.**, Honolulu, HI (US)

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(72) Inventor: **Milton Diaz Perez**, Tiburon, CA (US)

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(\*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(Continued)

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**Related U.S. Application Data**

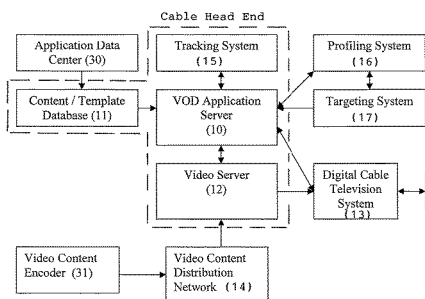
(60) Continuation of application No. 16/055,988, filed on Aug. 6, 2018, now Pat. No. 10,341,730, which is a (Continued)

(51) **Int. Cl.**  
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(Continued)

(52) **U.S. Cl.**  
CPC ..... **H04N 21/47202** (2013.01); **G06Q 30/02** (2013.01); **H04N 7/17318** (2013.01);  
(Continued)

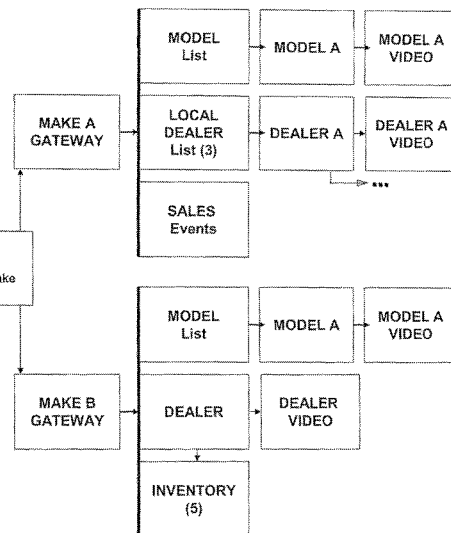
(57) **ABSTRACT**  
A video-on-demand (VOD) content delivery system has a VOD Application Server which manages a database of templates for presentation of video content elements of different selected types categorized in hierarchical order. A web-based Content Management System receives content uploaded online in file formats with metadata for title and topical area, and automatically converts it into video data format compatible with the VOD content delivery system indexed by title and topical area. A User Interface for the system delivers listings data to the viewer's TV indexed by title and topical area specified by the uploaded metadata.

**10 Claims, 7 Drawing Sheets**



VOD Content Delivery System, Overall Architecture

Drill Down  
Navigation Example



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**H04N 21/222** (2011.01)  
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**H04N 7/173** (2011.01)

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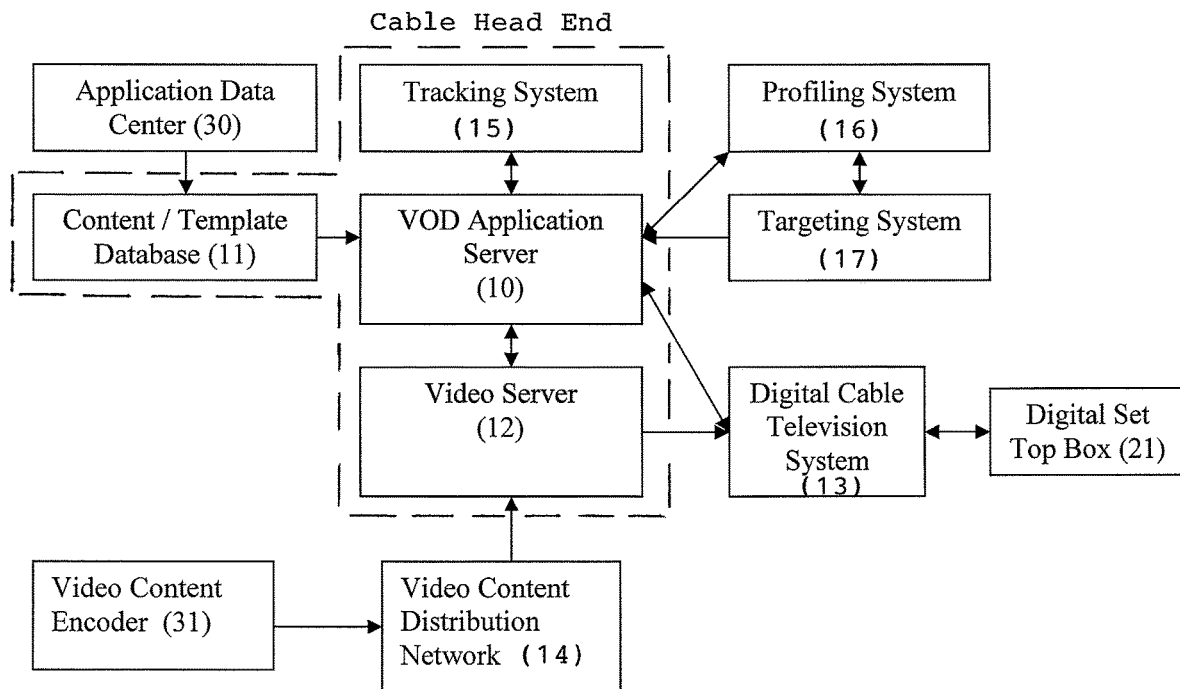


Figure 1A: VOD Content Delivery System, Overall Architecture



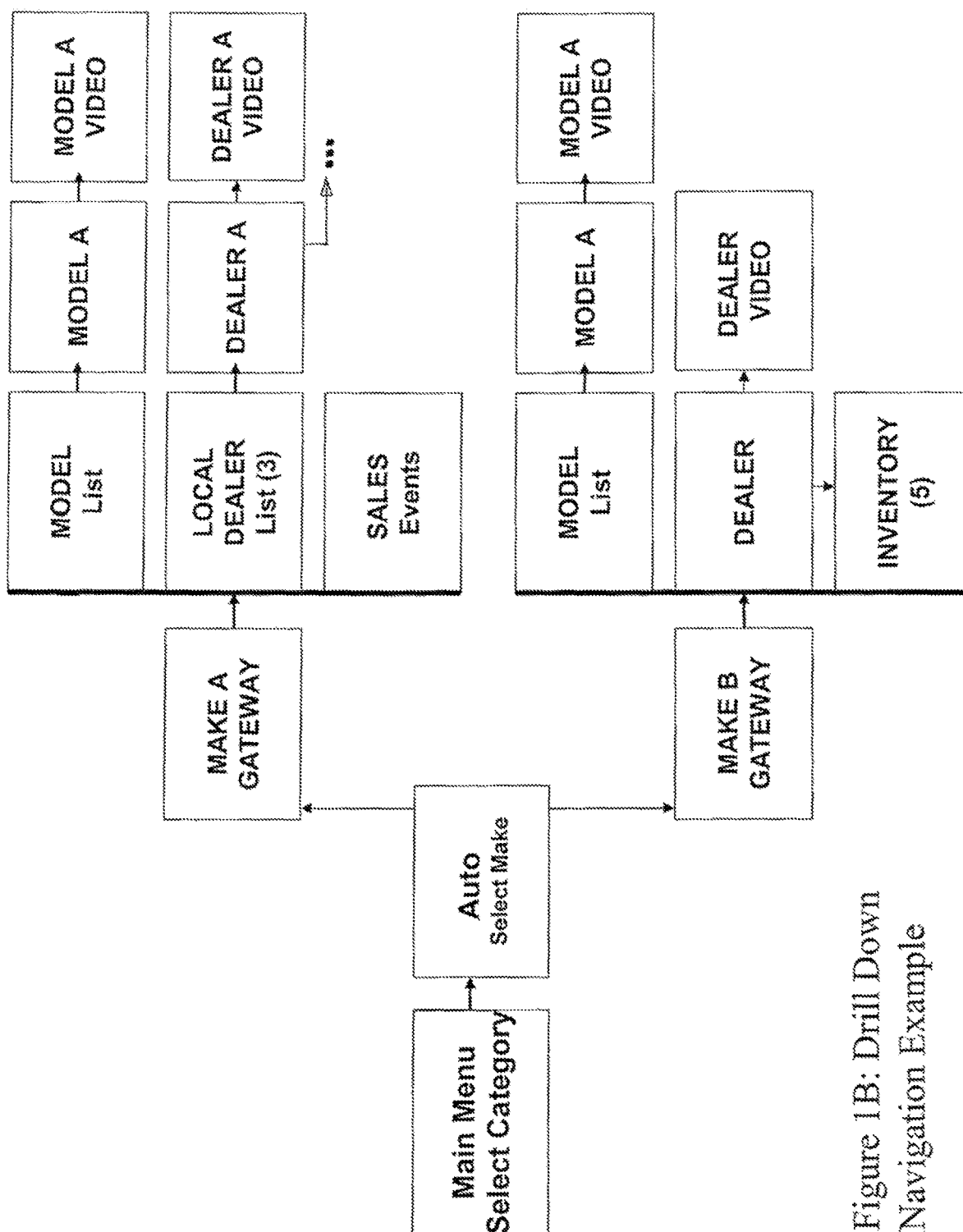
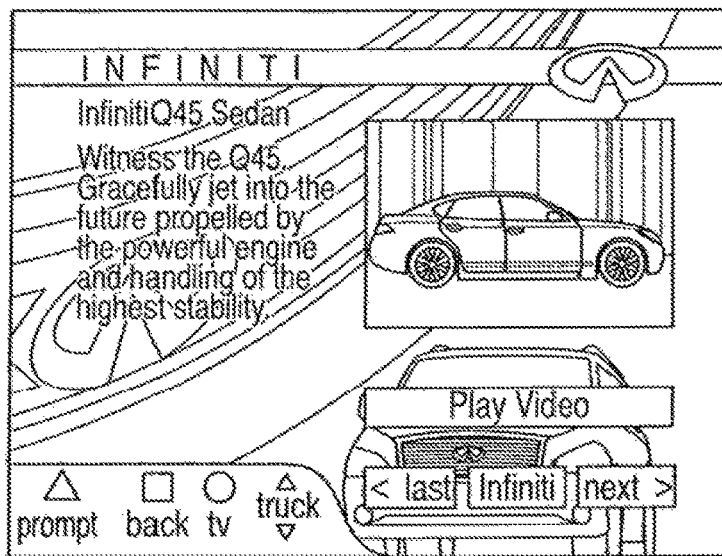
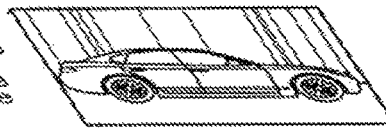


Figure 1B: Drill Down Navigation Example



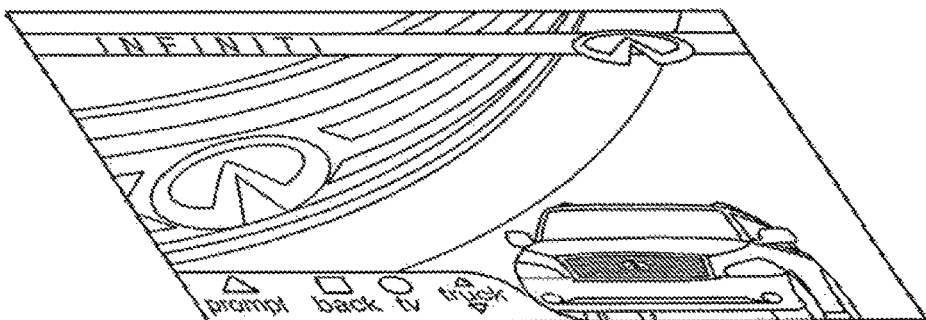
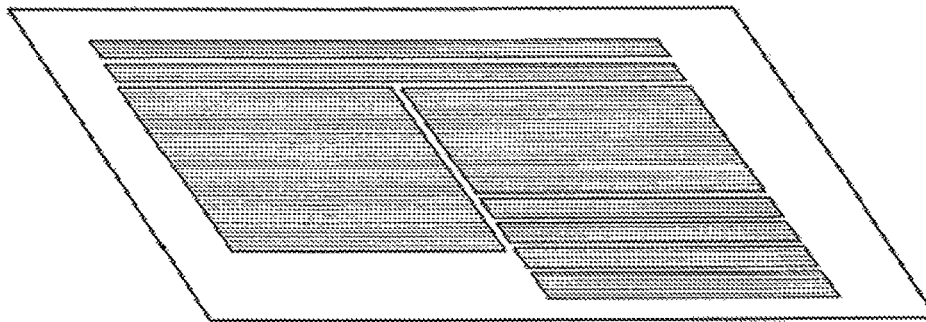
Infiniti Q45 Sedan  
Witness the Q45.  
Gracefully jet into the  
future propelled by  
the powerful engine  
and handling of the  
highest stability.



Play Video

< last Infiniti next >

FIG. 10C



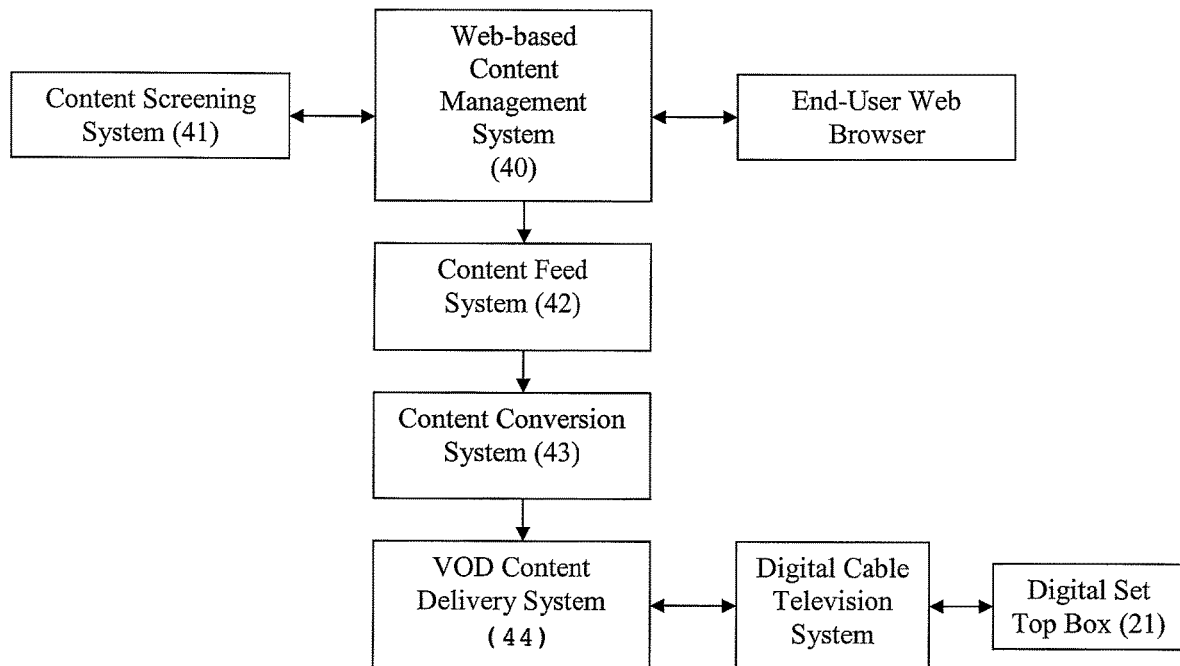


Figure 2A: Classified Ad System, Overall Architecture

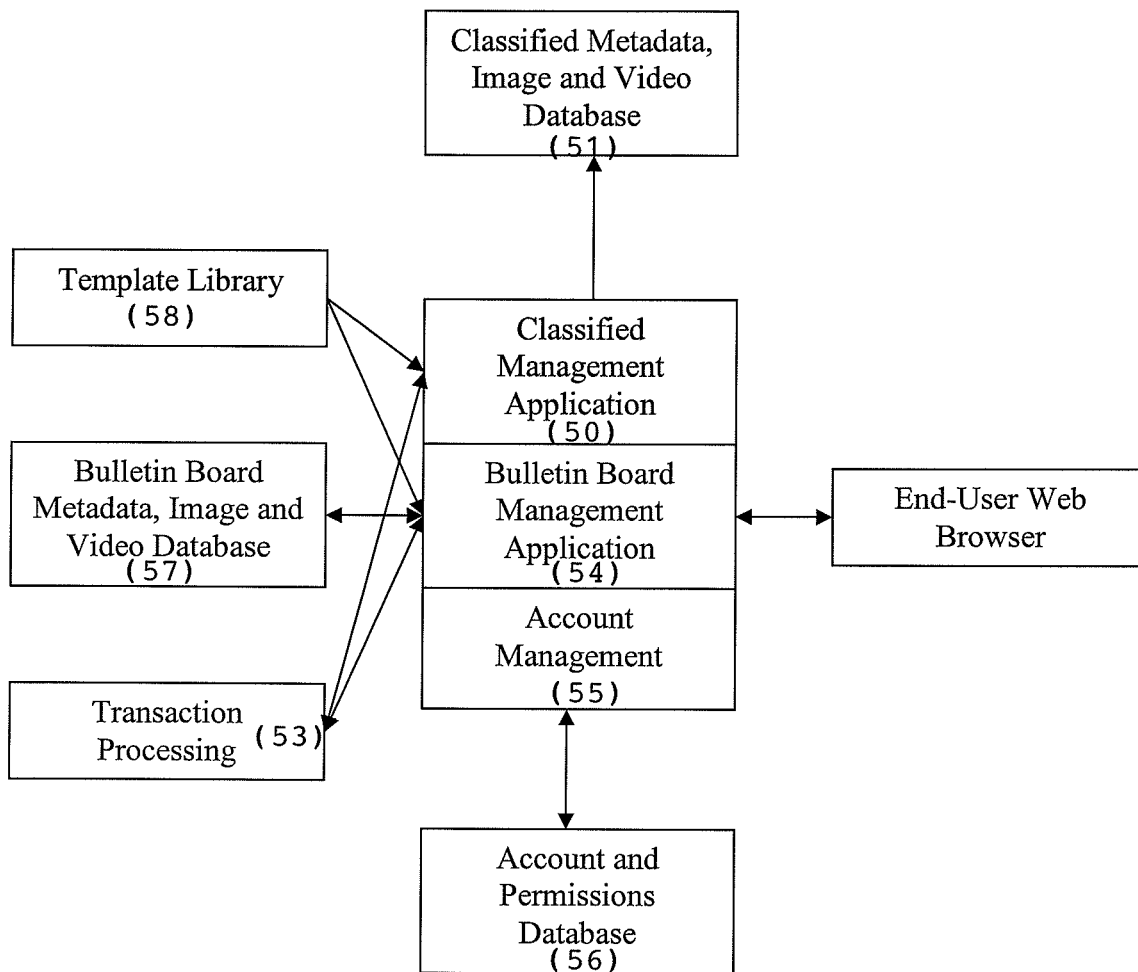


Figure 2B: Web-based Content Management System

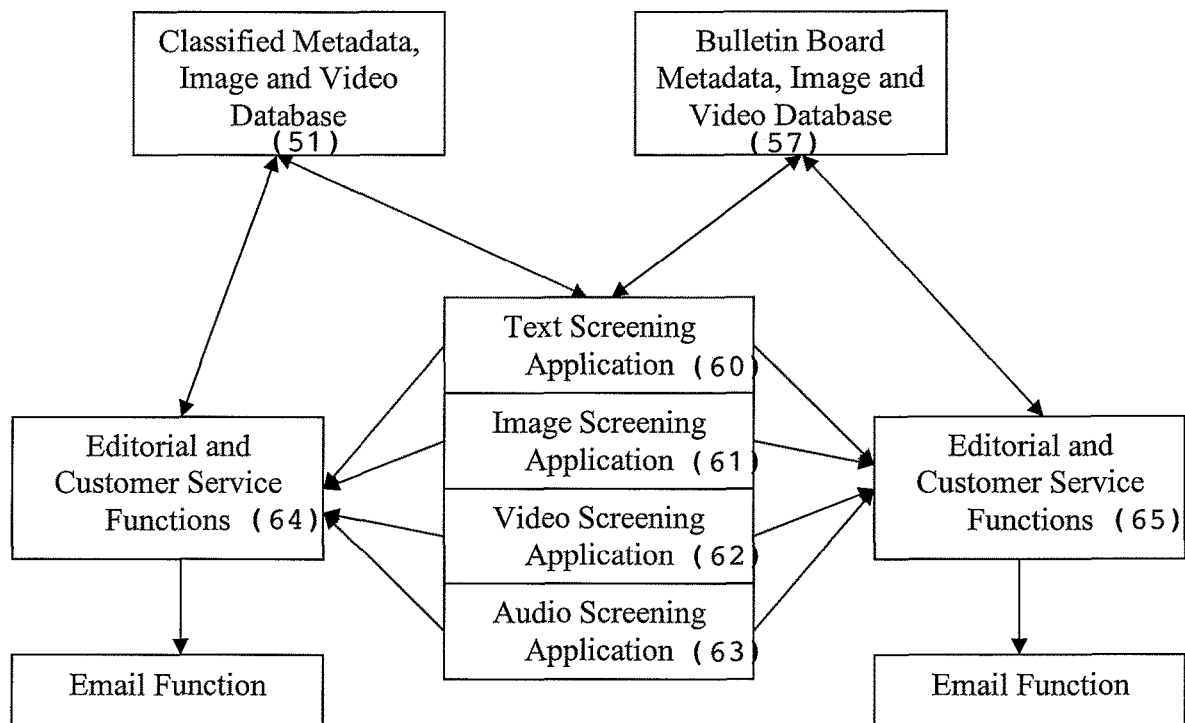


Figure 2C: Content Screening System

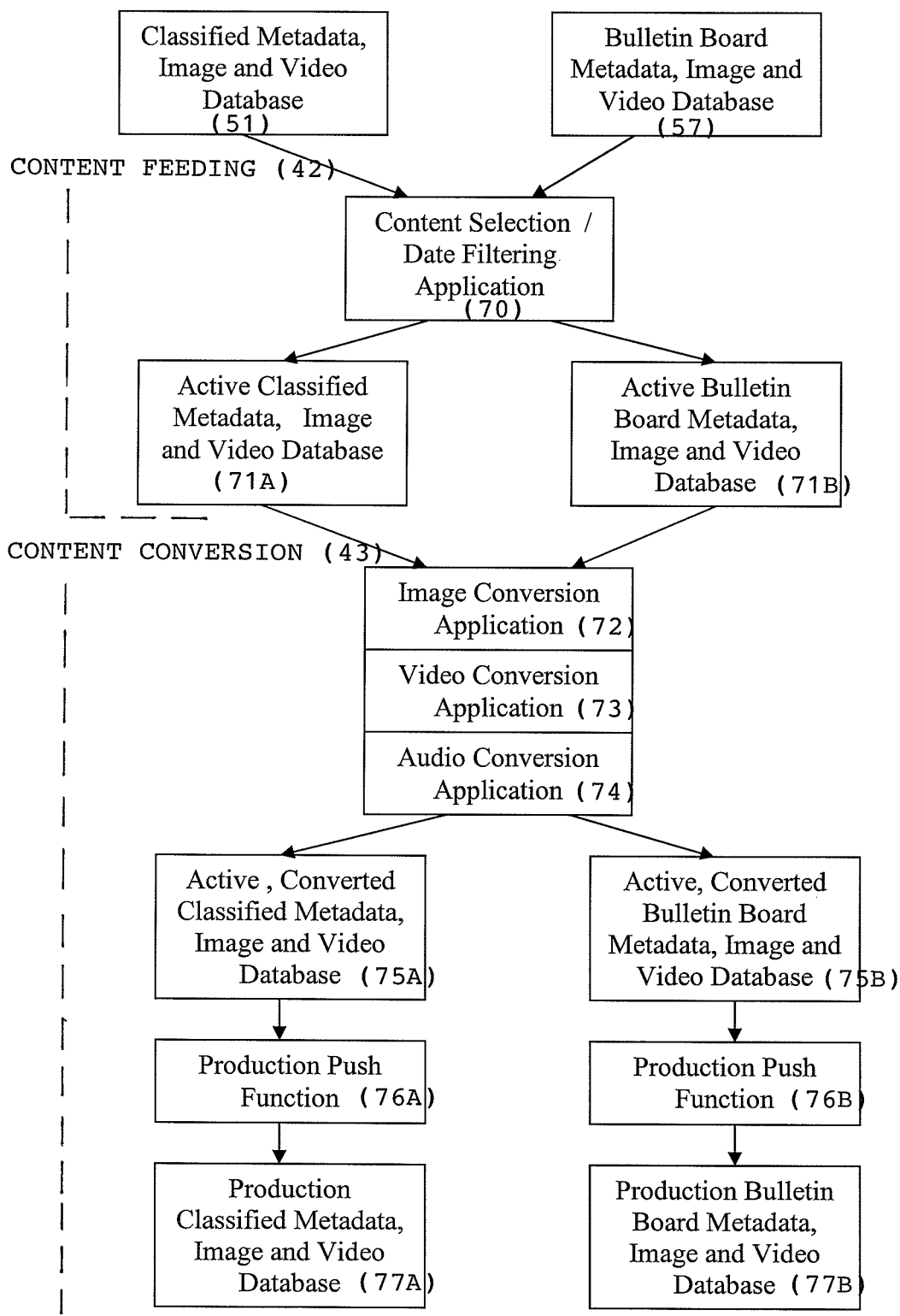


Figure 2D: Content Feed and Conversion System

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**VIDEO-ON-DEMAND CONTENT DELIVERY  
SYSTEM FOR PROVIDING  
VIDEO-ON-DEMAND SERVICES TO TV  
SERVICE SUBSCRIBERS**

**CROSS-REFERENCE TO RELATED  
APPLICATIONS**

This U.S. patent application is a continuation application and claims the benefit of copending U.S. patent application Ser. No. 16/055,988, filed on Aug. 6, 2018, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", which is a continuation application and claims the benefit of U.S. patent application Ser. No. 15/864,561, filed on Jan. 8, 2018, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 10,045,084 on Aug. 7, 2018, which is a continuation application of U.S. patent application Ser. No. 15/589,196, filed on May 8, 2017, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,866,910 on Jan. 9, 2018, which is a continuation application of U.S. patent application Ser. No. 15/253,321, filed on Aug. 31, 2016, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY SYSTEM FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICES SUBSCRIBERS", issued as U.S. Pat. No. 9,648,388 on May 9, 2017, which is a continuation application of U.S. patent application Ser. No. 14/978,953, filed on Dec. 22, 2015, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY METHOD FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,491,511 on Nov. 8, 2016, which is a continuation application of U.S. patent application Ser. No. 14/706,721, filed on May 7, 2015, of the same inventor and entitled "VIDEO-ON-DEMAND CONTENT DELIVERY METHOD FOR PROVIDING VIDEO-ON-DEMAND SERVICES TO TV SERVICE SUBSCRIBERS", issued as U.S. Pat. No. 9,338,511 on May 10, 2016, which is a continuation application of U.S. patent application Ser. No. 12/852,663, filed on Aug. 9, 2010, of the same inventor and entitled "SYSTEM FOR ADDING OR UPDATING VIDEO CONTENT FROM INTERNET SOURCES TO EXISTING VIDEO-ON-DEMAND APPLICATION OF A DIGITAL TV SERVICES PROVIDER SYSTEM", issued as U.S. Pat. No. 9,078,016 on Jul. 7, 2015, which is a divisional application of U.S. patent application Ser. No. 11/952,552, filed on Dec. 7, 2007, of the same inventor and entitled "SYSTEM FOR MANAGING, CONVERTING, AND TRANSMITTING VIDEO CONTENT FOR UPLOADING ONLINE TO A DIGITAL TV SERVICES PROVIDER SYSTEM", issued as U.S. Pat. No. 7,774,819 on Aug. 10, 2010, which is a divisional application of U.S. patent application Ser. No. 10/909,192, filed on Jul. 30, 2004, of the same inventor and entitled "SYSTEM AND METHOD FOR MANAGING, CONVERTING AND DISPLAYING VIDEO CONTENT ON A VIDEO-ON-DEMAND PLATFORM, INCLUDING ADS USED FOR DRILL-DOWN NAVIGATION AND CONSUMER-GENERATED CLASSIFIED ADS", issued as U.S. Pat. No. 7,590,997 on Sep. 15, 2009, each of which is hereby incorporated by reference as if fully set forth herein.

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**TECHNICAL FIELD**

This invention generally relates to the provision of interactive television services through cable TV infrastructure, and more particularly, to a system and method for managing, converting and displaying video content on a video-on-demand platform, and particularly, advertising displays used for drill-down navigation and displays of consumer-generated classified ads on TV.

**BACKGROUND OF INVENTION**

Cable television (CATV) systems are used to deliver television services to a vast majority of TV-viewing homes in the U.S. and other technologically advanced countries. The typical CATV system has a cable service provider head end equipped with video servers to transmit CATV program signals through distribution lines to local nodes and from there to TV subscriber homes. Within the subscriber homes, the CATV program signals are transmitted to one or more customer-premises TVs which are coupled to external set-top boxes for channel tuning or are equipped with internal cable channel tuners.

Current CATV set-top boxes provide various functions for channel switching and program access between subscribers and the CATV head end. The more advanced digital set-top boxes are individually addressable from the CATV head end, and also allow subscribers to input via remote control units their selection inputs for transmission on a back channel of the connecting cable to the CATV head end, thereby enabling subscribers to access interactive television services and other types of advanced digital TV services. A primary type of interactive television system is referred to generally as a "video-on-demand" (VOD) system, wherein a viewer can enter a selection choice for a video program via the remote control unit to the set-top box and have the desired video program delivered instantaneously for display on the TV. Such VOD applications can include on-demand movies, documentaries, historic sports events, TV programs, infomercials, advertisements, music videos, short-subjects, and even individual screen displays of information. VOD-based interactive television services generally allow a viewer to use the remote control to cursor through an on-screen menu and select from a variety of titles for stored video programs for individual viewing on demand. Advanced remote control units include button controls with VCR-like functions that enable the viewer to start, stop, pause, rewind, or replay a selected video program or segment. In the future, VOD-based interactive television services may be integrated with or delivered with other advanced interactive television services, such as webpage browsing, e-mail, television purchase ("t-commerce") transactions, and multimedia delivery.

With the increasing interactive functionality and customer reach of interactive television services, advertisers and content providers are finding it increasingly attractive to employ on-demand advertising, program content, and TV transactions for home viewers. VOD content delivery platforms are being designed to seamlessly and conveniently deliver a wide range of types of advertising, content, and transaction services on demand to home viewers. An example of an advanced VOD delivery platform is the N-Band™ system offered by Navic Systems, Inc., d/b/a Navic Networks, of Needham, Mass. This is an integrated system which provides an application development platform for third party application developers to develop new VOD service applications, viewer interfaces, and ancillary interactive services

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for deployment on VOD channels of CATV operators in cable service areas throughout the U.S. A detailed description of the Navic N-Band system is contained in U.S. Patent Application 2002/066,106, filed on May 30, 2002, which is incorporated herein by reference.

Advanced digital set-top boxes also have the ability to collect data such as a log of channels tuned to and programs watched by the viewer. The set top box can be designed to collect and report this data automatically to the cable head end. At the head end location, the viewer data can be aggregated over many users with personally identifying data removed, and provided to advertisers and program sponsors for information in designing and targeting new ads and programs for viewer preferences, thereby resulting in increased viewership, higher viewer impressions per ad or program, and ultimately increased revenues.

Current VOD ads and program offerings are generally produced for mass audiences. It would be particularly desirable to adapt a VOD delivery platform to deliver ads, promotions, programs, and informational content by allowing viewers to navigate readily and visually to specific items of interest. Such visual navigation for content delivery would be more likely to create a satisfying viewer experience, and also to engage individual viewers in on-demand TV services and transactions. It would also be a particularly desirable to adapt a VOD delivery platform to receive uploads of user ads from individuals such as through an online network for search, navigation, and display to TV subscribers.

#### SUMMARY OF THE INVENTION

In accordance with a first objective of the present invention, a video-on-demand (VOD) content delivery system for delivery templated VOD content comprises:

(a) a VOD Application Server located at a Cable Head End which manages a Database of templates for generating templated VOD content in response to requests for specific video content elements by viewer request signals transmitted from the TV equipment of a viewer to the Cable Head End;

(b) a Video Server for storing video content encoded as video content elements and for supplying a requested video content element in response to the VOD Application Server for delivery to the TV equipment of the viewer; and

(c) an Application Data Center for creating and storing a plurality of different templates ordered in a hierarchy for presentation of video content elements of different selected types categorized in hierarchical order, wherein a template for display of a video content element in a higher level of the hierarchy includes a link to one or more templates and video content elements in a lower level of the hierarchy, said plurality of hierarchically-ordered templates and links being stored in the Database managed by the VOD Application Server, and

(d) wherein said VOD Application Server, in response to viewer request for a selected video content element of a higher order in the hierarchy, retrieves the corresponding template from said Database and corresponding video content element from said Video Server to provide a templated VOD content display on the viewer's TV equipment which includes one or more links to video content elements in a lower order of hierarchy, and upon viewer request selecting a link displayed in the templated VOD content to a video content element in the lower order of hierarchy, retrieves the corresponding template and video content element of lower order hierarchy for display on the viewer's TV equipment,

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thereby enabling the viewer to use drill-down navigation through TV displays of templated VOD content.

In a preferred embodiment of the templated VOD content delivery system, the system employs the templated content delivery to create a User Interface for the viewer to navigate through progressively more specific template (display ad) types linked in series to reach an end subject of interest to the viewer. Referred to herein as "Drill-Down Ads," the series of progressively more specific display ad types allow the subscriber to navigate to an end subject of interest while at the same time having a unique visual experience of moving visually through a series of ads mirroring the viewer's path to the end subject of interest.

As an example involving automobile advertising, the User Interface can provide a hierarchical ordering of video display ads that starts with an Auto Maker's ad displayed with links to Model ads. The viewer can select using the remote control unit a specific Model ad which is displayed with links to more specific levels of ads, such as "Custom Packages", "Feature/Options", or "Color/Styling", etc., until it reaches an end subject of interest to the subscriber. The viewer would thus be able to navigate to specific content of interest while traversing through video ad displays of the Auto Maker, Models, Model A, Features, etc. Similarly, the viewer can navigate to specific content of interest while traversing through video ad displays of Local Dealers, Dealer A, Current Sales Promotions, etc. The templated VOD ads are generated dynamically by searching the VOD Application database with each current request by a viewer.

This enables the system to dynamically generate and display updated advertising content that remains current. For example, if the Auto Maker changes the Model types available, or if Local Dealer A changes its current sales promotions, that advertiser's ads can be updated with new content and selection options on the system database, and the new templated ads can be generated dynamically, instead of new ads having to be filmed, produced, contracted, and installed with the cable TV company. Many other types of ads, subjects, and other interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down ad designs.

In accordance with a second objective of the invention, a video-on-demand (VOD) content delivery system for managing, converting and displaying consumer-generated classified ads on TV comprises:

(a) a Content Management Website for enabling individual users to upload classified ad content on an online network connection from their remote computers, said uploaded classified ad content including associated meta data for identifying the ad content by title and topical area;

(b) a Content Screening Component for receiving the classified ad content uploaded to the Content Management Website and screening the content for objectionable text, audio, video and/or images in the content, and for rejecting said content if objectionable text, audio, video and/or images are found;

(c) a Content Feed Component for automatically transferring the classified ad content screened by the Content Screening Component with the associated meta data and supplying them to a Content Conversion Component;

(d) a Content Conversion Component for automatically converting the transferred classified ad content supplied from the Content Feed Component into a video data format compatible with the VOD content delivery system, and for



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automatically indexing the converted classified ad content in a Video Server database according to title and topical area as specified in the content meta data; and

(e) a VOD Application Server, operatively connected between said Content Conversion Component and a Cable Head End connected via cable connection to the TV equipment of viewers, for delivering from the Cable Head End classified ad title and topical area listings data generated from the meta data for the classified ad content to be displayed on the TV equipment of viewers to enable their searching for classified ads of interest and, in response to a viewer request signal requesting a specific classified ad of interest transmitted via the TV equipment to the Cable Head End, for retrieving the requested classified ad from the Video Server database and transmitting it to be displayed to the viewer on their TV equipment.

In a preferred embodiment of the TV classified ads system, individual users can upload classified ad content via their web browser, including text, audio, video and/or image files in industry-standard file formats, to the Content Management Website. The Content Screening Component is configured to parse the input for objectionable text words in text files, detect objectionable audio words in audio files, and optically recognize objectionable images in graphics or video files. The Content Feed Component automatically transmits classified ad content that has been appropriately contracted for display (paid for, and within the contracted time period) to the Content Conversion Component and the Video Server database. The VOD Application Server responds to requests input by viewers via remote control and retrieves the requested classified ads indexed by their titles and topical areas from the Video Server database to be displayed on the viewer's TV. The Content Management Website can also include functions for: (a) Account Management of user transaction accounts; (b) Content Classification to facilitate user designation of titles and topical areas to uniquely and attractively identify their classified ads; (c) Bulletin Board for creation and management of consumer-generated content related to announcements and other items of general interest to be displayed to viewers in subsidiary displays; and (d) Transaction Processing for the processing the payment of user fees, changes, and refunds in the use of the system.

The foregoing and other objects, features and advantages of the invention are described in further detail below in conjunction with the accompanying drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a diagram of an overall architecture for a VOD Content Delivery System in accordance with the present invention, FIG. 1B shows an example of Drill-Down Ad navigation, and FIG. 1C shows an example of the templated ad display model.

FIG. 2A is a process flow diagram of the overall architecture of a consumer generated Classified Ad application for the VOD Content Delivery System, FIG. 2B illustrates a Content Management Website for the Classified Ad application, FIG. 2C illustrates a Content Screening Component of the system, and FIG. 2D illustrates a Content Feed and Conversion Components of the system.

#### DETAILED DESCRIPTION OF INVENTION

Referring to FIG. 1A, an overall system architecture for a VOD content delivery system includes a VOD Application Server 10 located at a Cable Head End. The VOD Applica-

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tion Server 10 manages a Database 11 of templates and video content segments from Video Server 12 for generating templated VOD content. The VOD content is generated in response to a viewer request signal transmitted from the Digital Set Top Box 21 of a viewer's TV equipment through the Digital Cable Television System 13 to the VOD Application Server 10 at the Cable Head End. The VOD Application Server 10 may be of the type which enables any compatibly-developed VOD applications to be loaded on and operated on the server. An example of such a VOD Application Server is the Navic N-Band™ server as previously described. Templates for displaying VOD content are created at an Application Data Center 30 and stored in the Database 11 for use by the operative VOD application. The templates may be designed, for example, to present video ad content displays in a logo frame, or to provide navigation buttons and viewer selection options in a frame around currently displayed video content. In the preferred embodiment described in greater detail below, the templates are used to provide navigation aids in a series of progressively more focused ad display types. A Video Content Encoder 31 is used to encode raw video feeds into formatted video content segments compatible with the VOD platform and supply them through a Video Content Distribution Network 14 to the Video Server 12.

In operation, the VOD Application Server 10 operates a VOD application for the CATV system, for example, "automobile infomercials on demand". The viewer sends a request for selected VOD content, such as to see an infomercial on a specific model type made by a specific auto manufacturer, by actuating a viewer request signal by a key press on the viewer's remote control unit transmitting an IR signal to the Set Top Box 21 that is sent on a back channel of the Digital Cable Television System 13 to the VOD Application Server 10 at the Cable Head End. In response to the signal, the VOD Application Server 10 determines the VOD content being requested and retrieves the infomercial ad display template from the Template Database 11 and video content segment from the Video Server 12, in order to generate the corresponding templated VOD content. In the invention, the templates are of different types ordered in a hierarchy, and display of content in a template of a higher order includes links the viewer can select to content of a lower order in the hierarchy. Upon selecting a link using the remote control, the VOD Application Server 10 retrieves the template and video content of lower order and displays it to the viewer. Each successive templated display may have further links to successively lower levels of content in the hierarchy, such that the viewer can use the series of linked templated VOD displays as a "drill-down navigation" method to find specific end content of interest.

Referring to FIG. 1B, a preferred embodiment of the templated VOD content delivery system is shown providing a User Interface using Drill-Down Navigation through display ads, such as for automobile infomercials. When the viewer selects a VOD application (channel), such as "Wheels-On-Demand", the viewer's TV displays a Main Menu with buttons inviting the viewer to "Select Category". The viewer can select an "Auto" category, and the TV then displays an "Auto" menu with buttons inviting the viewer to "Select Make", such as Make A, Make B, etc. When the viewer makes a selection, such as Make A, the viewer's TV displays a further menu that is a Gateway into templated VOD content delivery which enables Drill-Down Navigation by templated display ads. Through the Gateway, the VOD Application leaves the Menu mode and enters the Drill Down Navigation mode for successively displays of hierar-

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chically-ordered video content which allow the viewer to navigate to progressively more focused content. In this example, the highest level of the hierarchy includes categories for Model, Local Dealer, Sales Events, and/or Inventory. When the viewer selects a category such as “Model” from the Gateway, for example, the VOD Application creates a templated ad display showing video content generic to all models by that automaker framed in a frame which has links (buttons or choices) for a list of the specific models made by that automaker. When the viewer selects the link to a specific model, “Model A” for example, the VOD Application creates a templated ad display showing video content for Model A, and the viewer can then choose to run a long-form infomercial of the Model A video. Alternatively, the Drill-Down Navigation can continue with further levels of specificity, such as “Custom Packages”, “Options”, “Colors/Stylings”, etc. Similarly, the selection of the “Local Dealer” category from the Gateway can bring up a templated ad for local dealers with links to specific local dealers in the viewer’s cable service area, and a click on a specific “Dealer A” can bring up a templated ad for Dealer A with further links to more specific content pertaining to Dealer A, such as “Current Sales Promotions”, etc.

In this manner, the templated VOD content delivery system allows the viewer to navigate to specific content of high interest to the viewer using the Drill-Down ads as a navigation tool, while at the same time having a unique visual experience of moving through a series of ads mirroring the viewer’s path to the subject of interest. The templated VOD ads are generated dynamically by searching the Content/Template database with each request by a viewer, enabling the system to display updated navigation choices and content simply by updating the database with updated links and video content. For example, if the Auto Maker changes the Model types of autos currently available, or if Local Dealer A changes its current sales promotions for autos currently available, that advertiser’s ads can be updated with new, template frame navigation links and content, instead of entirely new ads or screen displays having to be shot, produced, contracted, delivered, and programmed with the cable TV company. Many other types of layered or in depth ads, subjects, and interactive TV applications can be enabled with the use of the Drill-Down Navigation method. The selections or preferences exhibited by viewer navigation paths through the Drill-Down Navigation can also be tracked, profiled, and/or targeted as feedback data to advertisers for fine-tuning Drill-Down Navigation designs.

In FIG. 1C, an example illustrates how a templated VOD display is generated in layers. A Background screen provides a basic color, logo, or graphical theme to the display. A selected Template (display frame) appropriate to the navigation level the intended display resides on is layered on the Background. The Template typically has a frame in which defined areas are reserved for text, display image(s), and navigation links (buttons). Finally, the desired content constituted by associated Text, Image & Buttons is retrieved from the database and layered on the Template. The resulting screen display shows the combined background logo or theme, navigation frame, and text, video images, and buttons.

Referring again to FIG. 1A, a Tracking System 15 of conventional type can be installed at the Cable Head End to aggregate non-personal data on what channels and programs viewers watch. For the Drill Down Navigation method, the Tracking System 15 can include tracking of the navigation paths viewers use to find subjects of interest in a VOD

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Application. The aggregation of viewer navigation data can indicate what subjects are most popular, whether some subjects are of greater interest to viewers at certain times of day, of certain demographics, or in relation to certain products or services. The VOD Application Server 10 can export the aggregated viewer navigation data to an external Profiling System 16, such as a non-biased or unrelated firm applying profile analysis methods. The results of the Profiling System 16 can be communicated to a Targeting System 17, such as a template design firm or content production company, to fine-tune the presentation of the templated VOD content consistent with viewer preferences or interests. The feedback from the Targeting System can be supplied as feedback to the VOD Application Server to modify the Content/Template Database 11.

Another application for the templated VOD content delivery system can be developed to support video advertisements which link national to local market ad campaigns in “drill-down” fashion. Advertisers, both national and local, can pay for placement of their video advertisements on the system. When the VOD Application is run, the national ads are displayed as a Gateway to linking to the local market ads. In this manner, national ads can be used to transition viewers from general interest in a product to finding specific information about the product available locally.

The templated VOD content delivery system can also support “traffic building” videos, including music videos, that may not generate direct revenue. Once a video is encoded and registered into the system, the management and distribution of the video is conducted through software systems and automated controls. The User Interface provides the user with the ability to navigate and find desired video content. Selection of a category presents the user with a list of video titles available for playback. Categories and title lists can be generated using real-time database queries, allowing for database-driven management of content within the User Interface. The User Interface can also support a search interface which allows the user to search the video content database to generate a list of video titles with specific characteristics.

The core services and functions of the VOD content delivery system can include:

Encoding—converts videos to proper digital format for playback on cable video-on-demand systems, currently MPEG2 format

Metadata Input—allows for the input of descriptive data regarding each video

Packaging—Prepares a data package for transport consisting of the encoded video file and the metadata

Scheduling—Establishes the schedule when packages are to be delivered to cable video-on-demand systems via the transport system

Transport—Digital broadcast medium through which the packages are migrated from the central processing facility to the cable video-on-demand systems.

The core services and functions of the User Interface system can include:

Development of UI “pages”—An Internet-based system is used for the composition, coding and quality assurance of the User Interface images (“pages”) that are presented to the user on an interactive basis.

Category and List Presentation—The category lists and title lists presented to the user for navigation and selection can be generated and rendered real-time using database queries against the video metadata database. These lists can also be incorporated in the fully rendered graphics if real-time queries are not required or desired.

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Distribution—The UI system supports a scheduling and transport subsystem separate from the video distribution system for the distribution of the UI assets and related set-top box software components to local UI servers installed at the cable head end.

User Input Device—The UI system receives user input and commands from the IR remote control used with the digital set-top box.

User Database—The UI system maintains a database of set-top box addresses that is used to identify the users of the system. This database is the seed for the Profiling Database system described below.

Targeting—The UI system is capable of changing the UI presentation to a specific user based on the information contained in the User Database and the Profiling Database.

The core services and functions of the Tracking System can include:

Consolidation of Video-On-Demand Data—The Tracking System can be made capable of ingesting and consolidating usage data provided by the cable video-on-demand systems. This may be performed through automated interfaces or “feeds”, or it may be performed through the batch processing of data files delivered by the cable operators.

Consolidation of UI Data—The Tracking System can gather and consolidate data from the UI system on an automated basis. The UI system can provide data describing the user commands, behaviors, responses and requests generated by each user while using the User Interface system.

Reporting—The Tracking System can generate reports and analyses of the Video-On-Demand data and the UI data.

Web Interface—The Tracking System can include a Web interface for providing authorized users such as advertisers with access to specific reports.

The core services and functions of the Profiling System can include:

Consolidation of Profiling Data—The Profiling System can be made capable of consolidating on a continuing, automated basis all user-related data requested by advertisers or by the system operator.

Interface to Targeting System—The Profiling System can provide pertinent data as required by the Targeting System within the UI system. This data is used to reformat UI presentations based on the data values.

Interface to Targeting System—The Profiling System data can be accessed and incorporated into the Targeting System.

Support of Private and Public Data—The Profiling System can segregate and maintain as private any data gathered specifically for an advertiser for the use of that advertiser.

As another aspect of the present invention, a VOD content delivery system may be adapted to offer consumer-generated classified ads on TV. The VOD content delivery system is provided with a Content Management frontend to receive consumer input and convert it to video display ads maintained in the system database. Referring to FIG. 2A, a system for managing, converting and displaying individual consumer-generated ads on a VOD content delivery system has a Web-based Content Management System 40 for enabling an individual user to upload content from their computer via a web browser to display a consumer-generated video ad on TV. The uploaded content includes meta data for classifying the video ad by title and topical area(s). Content Screening System 41 is used for screening the content input by the individual user, such as by performing automatic searching for objectionable text, audio, video and/or images and rejecting the content if found objectionable. A Content Feed System 42 is used to automatically transfer consumer-generated content screened through the

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Content Screening System 41 to a Content Conversion System 43. This system automatically converts the consumer-generated content supplied by the Content Feed System 42 into video display format compatible with the VOD content delivery system. The converted video ad is indexed by title and classified topical areas according to the meta data supplied by the user, in accordance with the indexing system maintained by the Content Management System. The VOD Content Delivery System 44 operates a Classified Ads VOD Application in which menus for finding classified ads are navigated by viewers, and specific classified ads are delivered through the Digital Cable Television System for display as video ads on the viewer's TV equipment in response to viewer request input by remote control to the Digital Set Top Box 21, as described previously with respect to the operation of the general VOD platform.

Referring to FIG. 2B, the Web-based Content Management System 40 includes a plurality of functional components to allow consumers to create and manage their own classified ads as interactive television content, as well as pay for the distribution of their content within the digital cable television system. A Classified Management Application 50 is used to receive consumer-input content, have it screened (by the Content Screening System 41, not shown), and store it in the Classified Metadata, Image and Video Database 51. Consumer payment for running video ads is handled by the Transaction Processing Component 53. Also included in the Content Management System is an Account Management Component 55 and Account & Permissions Database 56 for management of user accounts for use of the web-based TV Classified Ads system. A Bulletin Board Ads application may be operated in parallel with the TV Classified Ads application. A Bulletin Board Management Application 54 and Database 57 enable the creation and management of consumer-generated content relating to public announcements and other items of general interest for groups, organizations or topics. The preferred VOD Content Delivery System uses templated VOD content, and a Template Library 58 is used to store templates for both the Classified Ads and Bulletin Board Ads applications.

The Account Management Component controls the access by persons to the web-based Content Management System. The Account Management Component identifies persons accessing the system for the first time and allows these persons to register and create an account by providing an account name, password, credit card information and other information required for the payment of fees. The Account Management Component controls the access by registered users to their accounts and manages the privileges and security associated to all accounts. Persons may create accounts for the creation and management of Classified Ads. Accounts capable of accessing the Bulletin Board Management Application may also be assigned by a system administrator in the Account Management Component. Any account capable of accessing the Bulletin Board application can then create and manage bulletin board ads for the assigned bulletin boards.

The Classified Content Management System enables users to upload text, audio, video, and/or image files for classified ads in industry-standard file formats and have it converted into video display ads compatible with the VOD Content Delivery System. Classified ads are searched on the viewer's TV equipment by menus and lists indexed by title and topical areas corresponding to the metadata associated with the classified ads content. Selection of a listed item results in the display of a TV display ad containing uploaded text, images, video and/or audio. Users pay listing fees to the

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operator of the system for maintaining and displaying the classified ads on the digital cable television system.

Significant features of the Classified Ads Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) uploading digital images of the item to the Content Management System; (c) uploading digital video of the item to the Content Management System; (d) uploading digital audio regarding the item to the Content Management System; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided content; (j) ability to save classified content in persistent memory or storage for subsequent modification; (k) ability to mark classified content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when a classified content item is to become accessible by users of the interactive television system and the data and time when a classified content item is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that a specific content item is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created classified content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific consumer-generated content by users of the interactive television system; and (p) ability to calculate fees for classified content and submit payment of the fees using the Transaction Processing system.

As noted in (i) above, the Classified Content Management System allows the user to view the content they have composed using the templates. The templates are designed specifically for use on interactive television systems and the user is able to view on the web-interface their content as composed for presentation on television. As noted in (j) above, the Classified Content Management System allows the persistent storage of classified content; although the user is composing interactive television pages using a template system, the content is persistently stored as individual elements to simplify changes by the user and to allow the conversion of the content to different formats as required by different interactive television systems.

The Bulletin Board Content Management System provides the users of the web-based Content Management System with content creation and content management tools for the creation and maintenance of consumer-generated content related to announcements and other informational items of general interest. Bulletin Board content is displayed on the interactive television system as dedicated interactive television screens (bulletin boards), where approved groups, organizations or topics are each assigned a bulletin board for the display of their information. Bulletin Board content is displayed as list items organized within a bulletin board; selection of a list item results in the display of an interactive television screen containing or providing access to the descriptive data, text, images, video and audio regarding the item.

An alternative implementation of a Bulletin Board can display the content as scrolling text, where the user scrolls through the text, or the text scrolls automatically. Bulletin

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Board accounts will pay fees determined by the operator of the system for the distribution of the bulletin board content on the interactive television system for display on the digital cable television system. Significant features of the Bulletin Board Content Management System include: (a) the ability to enter descriptive data and text regarding the item; (b) upload digital images to the content management; (c) upload digital video to the content management system; (d) upload digital audio to the content management system; (e) automated size and resolution processing of digital images uploaded to the system; (f) automated digital format conversion of digital video uploaded to the system; (g) automated digital format conversion of digital audio uploaded to the system; (h) ability for users to select an interactive television screen design (template) from a catalog of available templates; (i) ability to view on a web browser the interactive television template containing the consumer-provided bulletin board content; (j) ability to save bulletin board content in persistent memory or storage for subsequent modification; (k) ability to mark bulletin board content as completed and ready for submission to the interactive television system; (l) ability to specify the date and time when specific bulletin board content is to become accessible by users of the interactive television system and the data and time when specific bulletin board content is to be removed from display on the interactive television system; (m) ability to notify the user through email or other communication system that specific bulletin board content is scheduled to be displayed or removed from the interactive television system; (n) ability to modify and resubmit previously created bulletin board content for display on the interactive television system; (o) ability to access viewing data generated by the Tracking System regarding access and use of specific bulletin board content by users of the interactive television system; and (p) ability to calculate fees for bulletin board content and submit payment of the fees in conjunction with the Transaction Processing component.

The Transaction Processing component allows users of the Classified Content Management System and Bulletin Board Content Management System to determine and pay for any fees resulting from their use of these systems. The Transaction Processing component will allow users to pay for fees using credit cards or other supported payment methods. Significant features of the Transaction Processing component include: (a) ability to maintain business rules for use by the Transaction Processing system to determine fees based on user type and content type; (b) ability to maintain business rules for one or more payment methods for use by the Transaction Processing system in handling the settlement of fees; (c) ability to maintain business rules for user account and payment settlement conditions such as delinquency and lack-of-credit for use by the Transaction Processing system in determining user account privileges and content status; and, (d) ability to process payment of fees in real-time for payment methods that support real-time settlement.

Referring to FIG. 2C, the Content Screening System (41) is comprised of a Text Screening Application 60 which searches for objectionable words or phrases, an Image Screening Application 61 which searches for objectionable graphic images, a Video Screening Application 62 which searches for objectionable images or audio words or phrases in video segments, and an Audio Screening Application 63 which searches for objectionable words or phrases in audio segments. The Content Screening System can be used for both Classified Ads content and Bulletin Board content. Content that has been screened by the Content Screening

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System is then transferred to the aforementioned Classified Ads Database **51** or the Bulletin Board Content Database **57**. The system also has component **64** for Editorial and Customer Service Functions for Classified Ads, and component **65** similarly for Bulletin Board content. These can each include an Email Function to send confirmations of input, reasons for rejection of posting, suggested corrections, further processing, and posting of content to consumers using the system.

Significant features of the Content Screening System include: (a) ability to maintain a library of objectionable or illegal words and phrases for use in the screening of text; (b) ability to perform automated analysis of user content text using the text library as an input and alert system administration personnel to the use of objectionable or illegal content and the use of unknown and suspect words or phrases; (c) ability to maintain a library of objectionable or illegal image elements for use in the screening of images; (d) ability to perform automated image recognition analysis against user content images using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (e) ability to maintain a library of objectionable or illegal image elements for use in the screening of video; (f) ability to perform automated image recognition analysis against user content video using the library of image elements as an input and alert system administration personnel to the use of objectionable or illegal content; (g) ability to maintain a library of objectionable or illegal audio elements for use in the screening of audio; (h) ability to perform automated audio analysis against user content audio using the library of audio elements as an input and alert system administration personnel to the use of objectionable or illegal content; and (i) ability to save screened content in persistent memory or storage for subsequent processing. Content Screening is automatically performed with the Content Management System **40** during the user process of submitting and/or creating consumer-generated content or may be performed as a process subsequent to the creation of content by the user.

Referring to FIG. 2D, the Content Feed System **42** and the Content Conversion System **43** provide for the transfer of user content from the Content Screening System and conversion to video content format compatible with the VOD Content Delivery System **44**. The Content Feed System **42** has a Content Selection/Date Filtering Application which selects consumer-generated content uploaded to the system that is within the dates contracted for posting and display of the content as Classified Ads or on Bulletin Boards. Content within the active date range is transferred to the Active Classified Ads Database **71A** or the Active Bulletin Board Database **71B**.

The Content Conversion System receives consumer-generated content in industry standard formats or created in viewable format (HTML) on the web-based input system and converts the content into formats compatible with the VOD Content Delivery System and for display on viewers' televisions. The Content Conversion System **43** has an Image Conversion Application **72** which converts consumer-uploaded image files (in industry-standard formats such as JPEG, GIF, TIFF, BMP, PDF, PPT, etc.) into VOD content format, a Video Conversion Application **73** which converts consumer-uploaded video files into VOD content format, and an Audio Conversion Application **74** which converts consumer-uploaded audio files into VOD content format. Content converted to VOD content format is stored in the Active Converted Classified Ads Database **75A** or the Active Converted Bulletin Board Database **75B**. The content

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is subject to a further Production Push Function **76A**, **76B** and stored in the Production Classified Ads Database **77A** or the Production Bulletin Board Database **77B**, if any presentation formatting, date stamping, template framing, or other system editing is required by the system.

Significant features of the Content Feed System include: (a) ability to select user content for submission to the Content Conversion System through the testing of appropriate parameters including the date and time information contained in the user content; (b) ability to appropriately package the elements of the user content to permit the efficient transfer of these content elements to the Content Conversion System through an Application Program Interface or other interface; (c) ability to create, maintain and execute a schedule for when the Content Feed System will execute on an automatic basis for the automatic transfer of consumer-generated content to the Content Conversion System; and, (d) ability to execute the functions of the Content Feed System on a manual basis in the presence or absence of a schedule. The Content Feed System may be able to package and distribute content to single or multiple Content Conversion Systems.

Significant features of the Content Conversion system include: (a) ability to receive content packages delivered by the Content Feed System through an Application Program Interface or other interface; (b) ability to process the elements of consumer-generated content into data, text, graphic, video and audio elements that are compatible with the interactive television system and maintain the content presentation created by the user on the web-based Content Management System; (c) ability to save reformatted content in persistent memory or storage for subsequent distribution and use by the interactive television system; and, (d) ability to inform the interactive television system that consumer-generated content is available for distribution and use. The Content Conversion System may be added as a component system of the VOD Content Delivery System, or it may be implemented as a wholly separate system that connects to the VOD Content Delivery System through an Application Program Interface or other interface. When implemented as a system that is separate from the VOD Content Delivery System, it is possible to support multiple, different interactive television systems by either (a) incorporating multiple formatting requirements into a single instance of the Content Conversion System or (b) creating multiple Content Conversion Systems, each supporting the formatting requirements for a specific interactive television system. Either implementation allows for a single instance of consumer-generated content that is created and maintained using the web-based Content Management System to be distributed and displayed on multiple, different interactive television systems with different formatting requirements.

The VOD Content Delivery System **44**, as described previously, provides for the distribution of screened, converted, properly formatted consumer-generated content to viewers' televisions, typically through the use of digital set-top boxes connected to a digital cable television system capable of supporting real-time two-way data transfer between the set-top box and the Cable Head End. Significant features of the VOD Content Delivery System include: (a) ability to receive properly formatted content from the Content Conversion System; (b) ability to distribute said content over a digital cable television system and display this content on television as an interactive television presentation; (c) ability to receive user commands generated by an infrared remote control device, keyboard or other device; (d) ability to respond to the user commands by displaying

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appropriate content or executing desired functionality; and, (e) ability to generate and collect data regarding the user sessions and the viewing data regarding consumer-generated content on the interactive television system and make this data accessible to the Tracking System. The VOD Content Delivery System can employ templated VOD content delivery, as described previously with respect to FIG. 1A, enabling use of the Drill Down Navigation method in which viewers can navigate visually through classified ad hierarchical categories to specific titles or content.

The VOD Content Delivery System for the Classified Ads application can also employ the Tracking System 15 for the collection and consolidation of viewing data generated by the interactive television system and the generation of reports against this viewing data. For example, the Tracking System can track the number of viewer requests for viewing that a classified ad received in a given period and calculate billing charges accordingly. The Tracking System can make this information available to users of the Content Management System as well as to system administrative personnel performing general analysis of interactive television services and associated content. Significant features of the Tracking System include: (a) ability to access and process the data generated by the Classified Ads application; (b) ability to form summaries of the viewing data against desired parameters; (c) ability to save data, summaries and reports in persistent memory or storage for subsequent modification or access; (d) ability to make data, summaries and reports accessible by users of the web-based Content Management System, restricting the data accessible by any specific user to data regarding the content created by that user account on the Content Management System; and, (e) ability to make data, summaries and reports accessible by system administration personnel.

It is understood that many modifications and variations may be devised given the above description of the principles of the invention. It is intended that all such modifications and variations be considered as within the spirit and scope of this invention, as defined in the following claims.

What is claimed is:

1. A video-on-demand application server system comprising one or more computers and computer-readable memory operatively connected to the one or more computers of the video-on-demand application server system, and programmed to perform at least the following steps:

(a) receiving, by the video-on-demand application server system from a Web-based content management system, first video-on-demand application-readable metadata associated with first video content and usable to generate a video-on-demand content menu,

wherein the first video-on-demand application-readable metadata comprises:

- (1) first title information comprising a first title, and
- (2) first content provider designated hierarchically arranged category information and subcategory information to specify a location of the first title information for the video content in a video-on-demand application, the first content provider designated category information and subcategory information associated with the first title information of the first video content using a same hierarchical structure of categories and subcategories as is to be used for placement of the first title information in the video-on-demand content menu;

wherein the received first video content was uploaded to the Web-based content management system by a content provider device associated with a first video content provider via the Internet in a digital video format,

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along with the associated first video-on-demand application-readable metadata including first title information, and first content provider designated hierarchically arranged category information and subcategory information, designated by the first video content provider, to specify a hierarchical location of the first title of the first video content within the video-on-demand content menu using first category information and first subcategory information associated with the first title information, and further including first time information for availability of the first video content for scheduling of viewing of the first video content through the video-on-demand application;

(b) generating, by the video-on-demand application server system, video-on-demand content menu information data, including at least the first video-on-demand application-readable metadata associated with the first video content and usable to populate the video-on-demand content menu;

(c) sending, from the video-on-demand application server system to a respective set top box operatively connected to respective television equipment of a respective television service subscriber the generated video-on-demand content menu information data;

(d) generating, at the respective set-top box, using the video-on-demand content menu information data, the video-on-demand content menu for navigating through titles, including the first title of the first video content, by hierarchically-arranged category information and subcategory information, including at least the first category information and the first subcategory information in order to locate a respective one of the titles whose associated video content is desired for viewing on respective television equipment,

wherein the video-on-demand content menu lists the titles using the same hierarchical structure of category information and subcategory information as was designated by one or more video content providers, including the first video content provider, in the uploaded first video-on-demand application-readable metadata for the respective video content, wherein a plurality of different display templates, including a first display template, are accessible,

wherein which titles are available for selection from the video-on-demand content menu, at a respective time, is based at least in part on respective time information during which the respective video content associated with the respective time information can be accessed;

(e) receiving, by the video-on-demand application server system from the respective set top box, an electronic request for the first video content associated with the selected first title for display on the television equipment of the television service subscriber in response to the respective television service subscriber selecting, via a television control unit in communication with the respective set top box, the respective title associated with the video content from the hierarchically-arranged category information and subcategory information of the video-on-demand content menu;

(f) causing, by the video-on-demand application server system, to be transmitted to the respective set top box from a video server, the selected first video content for display on the respective TV equipment.

2. The video-on-demand application server system of claim 1, wherein the television control unit is a remote control unit.

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3. The video-on-demand application server system of claim 1, wherein at least some of the plurality of different display templates correspond to different levels of the hierarchical structure of the respective category information and subcategory information.

4. The video-on-demand application server system of claim 1, wherein the at least one of the plurality of different display templates is configured to display a logo frame.

5. The video-on-demand application server system of claim 1, wherein the at least one of the plurality of different display templates is configured to provide navigation buttons.

6. The video-on-demand application server system of claim 1, wherein the at least one of the plurality of different display templates is configured to provide viewer selection options.

7. The video-on-demand application server system of claim 1, wherein the respective category information and subcategory information associated with the first video

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content correspond to one or more topics that pertain to video content from more than one video content provider.

8. The video-on-demand application server system of claim 1, wherein at least one of the plurality of different display templates is used to generate a templated video-on-demand display that comprises a background and a template layer having one or more areas for display of the first video-on-demand application-readable metadata provided by the video content provider.

9. The video-on-demand application server system of claim 1, wherein the video-on-demand content menu comprises a search interface that allows the television service subscriber to search a video content database based on specified characteristics.

10. The video-on-demand application server system of claim 1, wherein the video-on-demand content menu is an interactive user interface.

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